JVC

SERVICE MANUAL

S-VHS VIDEO CASSETTE RECORDER

BR-S800U(A)/BR-S500U(A)

(S-VHS VIDEO CASSETTE RECORDER) **(S-VHS VIDEO CASSETTE PLAYER)**

BR-S800U(A)

BR-S500U(A)

S-VHS Hi-Fi

NOTE:

Under the circumstances that the BR-S800U/S500U has been improved in the circuitry, this service manual is issued as a wholly revised edition to give a full detail of the improvement.
This service manual is applicable to the improved sets that can be discriminated from previous sets by the marking (A) appearing on the rating label on the rear panel of the set.
When a set marked with (A) is an object of service, refer to this service manual without fail.
Detail of the latest improvement is as follows.

- Unstable vertical hold the LINEAR SLOW STILL mode is considerably improved.
- The "BACK SELECT" function (item No. 507) is added to the MENU switch SW-2.
- The "SUB WARNING INHIBIT" function (item No. 343) is shifted to the SERVICE MENU from the MENU switch SW-2.
- Reset function of the hour meter is removed.

The improved sets are roughly distinguishable by their serial numbers. Make sure of the marking (A) on the rating label or refer below serial numbers.

BR-S800U(A) : XXXX3321 and after
BR-S500U(A) : XXXX2708 and after

The symbol "(A)" at the last of the model number such as BR-S800U(A) or BR-S500U(A) does not appear in front of the mode number of the actual sets. This wording is used in this service manual only for distinguishing the lately improved sets from other sets marketed previously, because this service manual is inapplicable to the sets without the improvement.

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No. 9289B
November 1995

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Important Safety Precautions

Prior to shipment from the factory, JVC products are strictly inspected to conform with the recognized product safety and electrical codes of the countries in which they are to be sold. However, in order to maintain such compliance, it is equally important to implement the following precautions when a set is being serviced.

● Precautions during Servicing

1. Locations requiring special caution are denoted by labels and inscriptions on the cabinet, chassis and certain parts of the product. When performing service, be sure to read and comply with these and other cautionary notices appearing in the operation and service manuals.

2. Parts identified by the ⚠ symbol and shaded (▒) parts are critical for safety.
   Replace only with specified part numbers.
   Note: Parts in this category also include those specified to comply with X-ray emission standards for products using cathode ray tubes and those specified for compliance with various regulations regarding spurious radiation emission.

3. Fuse replacement caution notice.
   Caution for continued protection against fire hazard.
   Replace only with same type and rated fuse(s) as specified.

4. Use specified internal wiring. Note especially:
   1) Wires covered with PVC tubing
   2) Double insulated wires
   3) High voltage leads

5. Use specified insulating materials for hazardous live parts. Note especially:
   1) Insulation Tape
   2) PVC tubing
   3) Spacers
   4) Insulation sheets for transistors
   5) Barrier

6. When replacing AC primary side components (transformers, power cords, noise blocking capacitors, etc.) wrap ends of wires securely about the terminals before soldering.

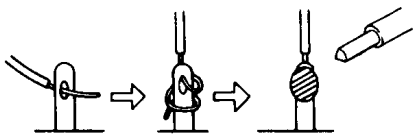


Fig. 1

7. Observe that wires do not contact heat producing parts (heat-sinks, oxide metal film resistors, fusible resistors, etc.)

8. Check that replaced wires do not contact sharp edged or pointed parts.

9. When a power cord has been replaced, check that 10—15 kg of force in any direction will not loosen it.

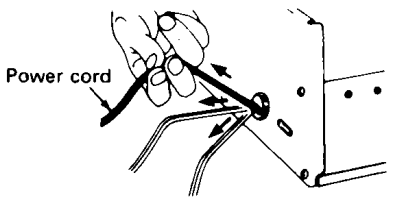


Fig. 2

10. Also check areas surrounding repaired locations.

11. Products using cathode ray tubes (CRTs)
    In regard to such products, the cathode ray tubes themselves, the high voltage circuits, and related circuits are specified for compliance with recognized codes pertaining to X-ray emission. Consequently, when servicing these products, replace the cathode ray tubes and other parts with only the specified parts. Under no circumstances attempt to modify these circuits. Unauthorized modification can increase the high voltage value and cause X-ray emission from the cathode ray tube.

12. Crimp type wire connector
    In such cases as when replacing the power transformer in sets where the connections between the power cord and power transformer primary lead wires are performed using crimp type connectors, if replacing the connectors is unavoidable, in order to prevent safety hazards, perform carefully and precisely according to the following steps.
    1) **Connector part number** : E03830-001
    2) **Required tool** : Connector crimping tool of the proper type which will not damage insulated parts.
    3) **Replacement procedure**
       (1) Remove the old connector by cutting the wires at a point close to the connector.
       Important : Do not reuse a connector (discard it).

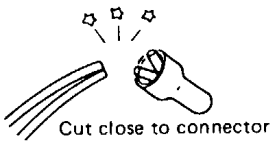


Fig. 3

(2) Strip about 15 mm of the insulation from the ends of the wires. If the wires are stranded, twist the strands to avoid frayed conductors.

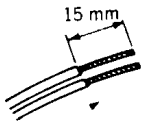


Fig. 4

(3) Align the lengths of the wires to be connected. Insert the wires fully into the connector.

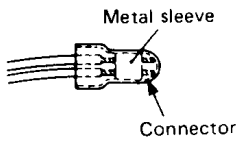


Fig. 5

(4) As shown in Fig. 6, use the crimping tool to crimp the metal sleeve at the center position. Be sure to crimp fully to the complete closure of the tool.

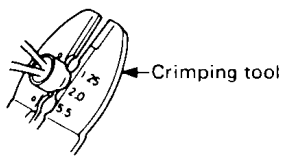


Fig. 6

(5) Check the four points noted in Fig. 7.

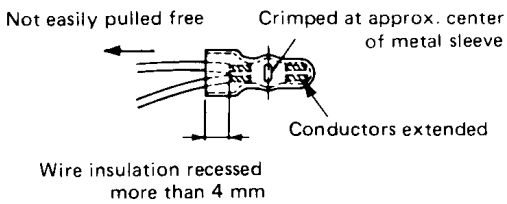

Not easily pulled free
Crimped at approx. center of metal sleeve
Conductors extended
Wire insulation recessed more than 4 mm

Fig. 7

● Safety Check after Servicing

Examine the area surrounding the repaired location for damage or deterioration. Observe that screws, parts and wires have been returned to original positions, Afterwards, perform the following tests and confirm the specified values in order to verify compliance with safety standards.

1. Insulation resistance test

Confirm the specified insulation resistance or greater between power cord plug prongs and externally exposed parts of the set (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.). See table 1 below.

2. Dielectric strength test

Confirm specified dielectric strength or greater between power cord plug prongs and exposed accessible parts of the set (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.). See table 1 below.

3. Clearance distance

When replacing primary circuit components, confirm specified clearance distance (d), (d') between soldered terminals, and between terminals and surrounding metallic parts. See table 1 below.

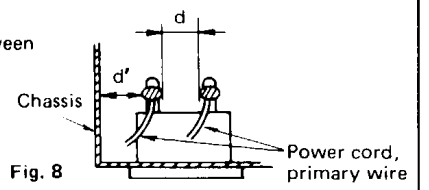


Fig. 8

4. Leakage current test

Confirm specified or lower leakage current between earth ground/power cord plug prongs and externally exposed accessible parts (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.).

Measuring Method: (Power ON)

Insert load Z between earth ground/power cord plug prongs and externally exposed accessible parts. Use an AC voltmeter to measure across both terminals of load Z. See figure 9 and following table 2.

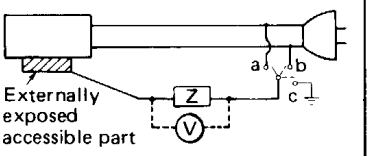


Fig. 9

5. Grounding (Class I model only)

Confirm specified or lower grounding impedance between earth pin in AC inlet and externally exposed accessible parts (Video in, Video out, Audio in, Audio out or Fixing screw etc.).

Measuring Method:

Connect milli ohm meter between earth pin in AC inlet and exposed accessible parts. See figure 10 and grounding specifications.

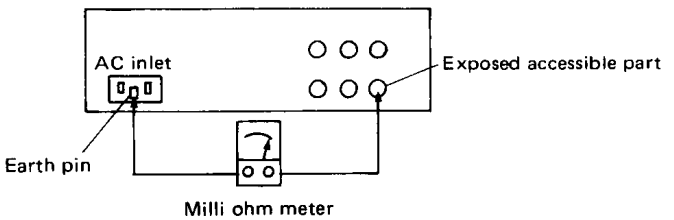


Fig. 10

Grounding Specifications

Region	Grounding Impedance (Z)
USA & Canada	Z ≦ 0.1 ohm
Europe & Australia	Z ≦ 0.5 ohm

AC Line Voltage	Region	Insulation Resistance (R)	Dielectric Strength	Clearance Distance (d), (d')
100 V	Japan	R≧1 MΩ/500 V DC	AC 1 kV 1 minute	d, d' ≧ 3 mm
100 to 240 V			AC 1.5 kV 1 minute	d, d' ≧ 4 mm
110 to 130 V	USA & Canada	–	AC 900 V 1 minute	d, d' ≧ 3.2 mm
110 to 130 V 200 to 240 V	Europe & Australia	R≧10 MΩ /500 V DC	AC 3 kV 1 minute (Class II) AC 1.5 kV 1 minute (Class I)	d ≧ 4 mm d' ≧ 8 mm (Power cord) d' ≧ 6 mm (Primary wire)

Table 1 Specifications for each region

AC Line Voltage	Region	Load Z	Leakage Current (i)	a, b, c
100 V	Japan	1 kΩ	i ≦ 1 mA rms	Exposed accessible parts
110 to 130 V	USA & Canada	0.15 μF, 1.5 kΩ	i ≦ 0.5 mA rms	Exposed accessible parts
110 to 130 V 220 to 240 V	Europe & Australia	2 kΩ	i ≦ 0.7 mA peak i ≦ 2 mA dc	Antenna earth terminals
		50 kΩ	i ≦ 0.7 mA peak i ≦ 2 mA dc	Other terminals

Table 2 Leakage current specifications for each region

Note: These tables are unofficial and for reference only. Be sure to confirm the precise values for your particular country and locality.

Read me first.

In the instruction manual, delete or add the function description as shown below.

Deletion ON/OFF function of the menu switch No. 343 "SUB WARNING INHIBIT" should be deleted. This function is fixed to the warning mode (OFF). When a malfunction occurs, a warning code is displayed.

Addition Menu switch No. 507 "BACK SELECT" should be added.

Setting: ALL (0) ..... Factory preset
EE ONLY (1)

Content: Selects the mode in which the VCR outputs blue back signals from a monitor output terminal.

ALL: EE mode when no video signal is input and Play mode when a tape with no recorded signal is played back.

EE ONLY: Only EE mode when no video signal is input.

On-Screen information is available in Menu switch-2 items when the menu switch No. 338 "MENU SW 2" is set to "OPEN".

INSTRUCTIONS

JVC

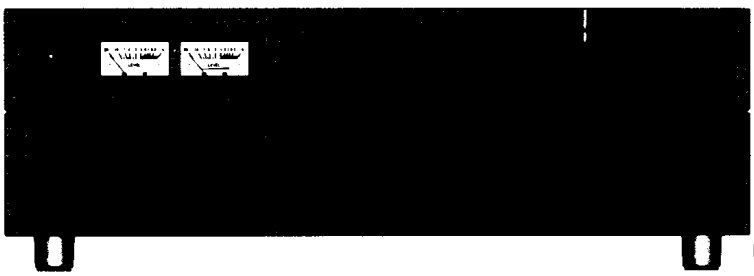
BR-S800U

VIDEO CASSETTE RECORDER

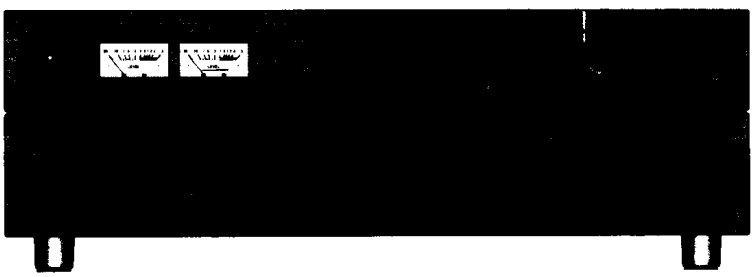
BR-S500U

VIDEO CASSETTE PLAYER

S-VHS Hi-Fi



BR-S800U



BR-S500U

For Custormer Use:

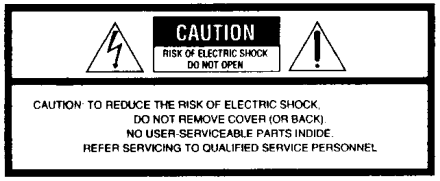
Enter below the Serial No. which is located on the rear of the cabinet. Retain this inforamtion for future reference.

Model No. **BR-S800U/BR-S500U**

Serial No. _____

PGD30002-440-02

SAFETY PRECAUTIONS


CAUTION
RISK OF ELECTRIC SHOCK
DO NOT OPEN
CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK,
DO NOT REMOVE COVER (OR BACK).
NO USER-SERVICEABLE PARTS INDIDE.
REFER SERVICING TO QUALIFIED SERVICE PERSONNEL

The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

WARNING:
TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.

This unit should be used with 120 V AC only.

CAUTION:
To prevent electric shocks and fire hazards, do NOT use any other power source.

NOTE:
The rating plate (serial number plate) is on the rear of the unit.

INFORMATION
This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

CAUTION

CHANGES OR MODIFICATIONS NOT APPROVED BY JVC COULD VOID USER'S AUTHORITY TO OPERATE THE EQUIPMENT.

THIS DEVICE COMPLIES WITH PART 15 OF THE FCC RULES. OPERATION IS SUBJECT TO THE FOLLOWING TWO CONDITIONS: (1) THIS DEVICE MAY NOT CAUSE HARMFUL INTERFERENCE, AND (2) THIS DEVICE MUST ACCEPT ANY INTERFERENCE RECEIVED, INCLUDING INTERFERENCE THAT MAY CAUSE UNDESIRED OPERATION.

ATTENTION
RISQUE D'ELECTROCUTION
NE PAS OUVRIR
ATTENTION: POUR EVITER TOUT RISQUE D'ELECTROCUTION
NE PAS OUVRIR LE BOITIER
AUCUNE PIECE INTERIEURE N'EST
A REGLER PAR L'UTILISATEUR
SE REFERER A UN AGENT QUALIFIE EN CAS DE PROBLEME.

Le symbole de l'éclair à l'intérieur d'un triangle équilatéral est destiné à alerter l'utilisateur sur la présence d'une "tension dangereuse" non isolée dans le boîtier du produit. Cette tension est suffisante pour provoquer l'électrocution de personnes.

Le point d'exclamation à l'intérieur d'un triangle équilatéral est destiné à alerter l'utilisateur sur la présence d'opérations d'entretien importantes au sujet desquelles des renseignements se trouvent dans le manuel d'instructions.

*Ces symboles ne sont utilisés qu'aux Etats-Unis.

AVERTISSEMENT:
POUR EVITER LES RISQUES D'INCENDIE OU D'ELECTROCUTION, NE PAS EXPOSER L'APPAREIL A L'HUMIDITE OU A LA PLUIE.

Ce magnétoscope ne doit être utilisé que sur du courant alternatif en 120 V.

ATTENTION:
Afin d'éviter tout resque d'incendie ou d'électrocution, ne pas utiliser d'autres sources d'alimentation électrique.

REMARQUE:
La plaque d'identification (numéro de série) se trouve sur le panneau arrière de l'appareil.

This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus as set out in the interference-causing equipment standard entitled "Digital Apparatus", ICES-003 of the Department of Communications.

Cet appareil numérique respecte les limites de bruits radioélectriques applicables aux appareils numériques de Classe B prescrites dans la norme sur le matériel brouilleur: "Appareils Numériques", NMB-003 édictée par le ministre des Communications.

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1 INTRODUCTION

1-1 ABOUT THIS MANUAL

This manual introduces you to the BR-S800U S-VHS Recorder and the BR-S500U S-VHS Player. The BR-S500U is a playback-only VCR. It does not have the recording capability of the BR-S800U. Read this manual carefully before setting up and operating the BR-S800U/BR-S500U. This manual consists of the following sections.

Section 1 INTRODUCTION
This section describes the organization of this manual and explains the main features and the precautions you should take when operating the BR-S800U/BR-S500U.

Section 2 CONTROLS, CONNECTORS, AND DISPLAYS
A basic description of all controls, connectors, and displays. If you are already familiar with professional editing techniques and know how to use a professional VCR, you will probably be able to start operating your VCR after you read this section.

Section 3 CONNECTIONS
This section describes how to connect the BR-S800U/BR-S500U to other units.

Section 4 MENU SWITCH SETTING
The BR-S800U/BR-S500U incorporate a "Menu Switch" function which lets you customize the VCR according to your requirements with a variety of settings on screen. Setting procedures and setting items are described in this section.

Section 5 LOADING/UNLOADING
This section describes how to load or unload video cassettes.

Section 6 PLAYBACK
This section describes preparations and settings for playback.

Section 7 RECORDING
This section describes preparations and settings for recording. This section can be omitted by BR-S500U users.

Section 8 EDITING WITH RM-G800U (option)
This section outlines editing procedures when using the BR-S800U/BR-S500U in combination with the optional editing controller RM-G800U. Refer to the RM-G800U's manual for details.

Section 9 IN CASE OF DIFFICULTY
This section suggests ways to respond to potential difficulties or malfunctions of your VCR.

Section 10 OPTIONAL ACCESSORIES
Optional boards and accessories are shown in this section.

Section 11 APPENDIX
This sections explains the terms which are used in this manual.

Section 12 SPECIFICATIONS
Specifications of the BR-S800U and BR-S500U are shown in this section.

Any description in this manual indicated as "BR-S800U only" refers to instructions applicable only to the BR-S800U. All VCR illustrations used in this manual are of the BR-S800U.

1-2 MAIN FEATURES

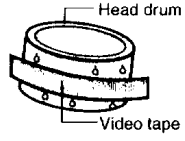
- The BR-S800U/BR-S500U offer the performance and functions required of professional VCRs.
- Rugged construction with DD (Direct Drive) motor and aluminum diecast chassis for professional use.
- A simple, low-cost editing system can be configured by combining the BR-S800U and BR-S500U with the optional RM-G800U editing controller.
- A built-in CTL time code generator/reader permits accurate editing is possible in combination with the RM-G800U. (CTL time code setting is only possible with the RM-G800U.)
- Easy system upgradeability with a variety of optional boards.

A Y/C filtering technique incorporated under license from FAROUDJA Laboratories.

1-3 PRECAUTIONS

VCR

- DO NOT use the recorder in places subject to the following conditions:
  – extreme heat, cold, or humidity,
  – dust,
  – near appliances generating strong magnetic fields,
  – vibrations, or
  – poor ventilation.
- Be careful of moisture condensation.
  DO NOT use the recorder immediately after moving it from a cold place to a warm place. This will cause water vapor to condense on the still-cold video head drum and tape guides and may damage the tape and the recorder.
  If condensation occurs, the warning code "021" appears on the counter and the cassette is ejected. (☞p.47) The drum will start rotating to dry the head drums. Keep the VCR power on until the warning code turns off.



- Handle the recorder carefully.
  • DO NOT block the ventilation openings.
  • DO NOT place anything heavy on the recorder.
  • DO NOT place liquids on the top of the recorder.
  • Use in horizontal (flat) position only.
- During transportation,
  • Avoid excessive shocks to the recorder during packing and transportation.
  • Before packing, be sure to remove the cassette from the recorder.
- Proper maintenance such as cleaning dust, adding oil, or replacing parts are necessary to obtain optimum performance and a longer service life. We recommend you do maintenance on a regular basis (once every 500 hours). Total drum rotation hours can be checked via on-screen display. (☞p.17)

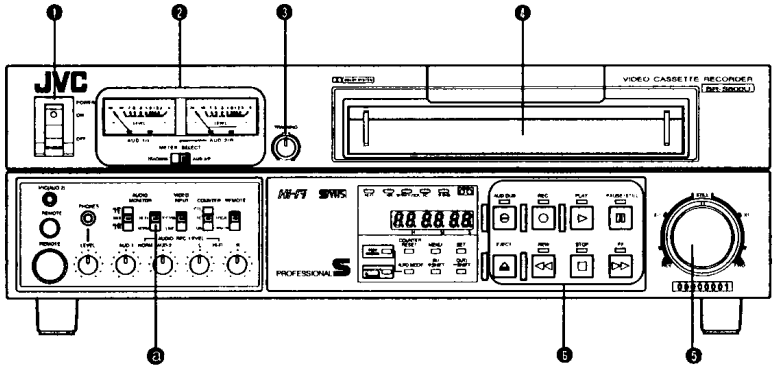
VIDEO CASSETTES

- This recorder uses S-VHS and VHS cassettes.
  S-VHS: ST-120 for 120 minutes, ST-90 for 90 minutes, ST-60 for 60 minutes, and ST-30 for 30 minutes.
  VHS: T-120 for 120 minutes, T-90 for 90 minutes, T-60 for 60 minutes, and T-30 for 30 minutes.
  An optional cassette adapter (SA-CP11U) is required when using C-size cassettes. Use ST-C30/C20 or T-C30/20 cassettes.
  Do not use T-210 (210 minutes) cassettes or anything longer.
- DO NOT expose the cassettes to direct sunlight. Keep them away from heaters.
- DO NOT expose the cassettes to extreme humidity, violent vibrations or shocks, strong magnetic fields (near a motor, transformer or magnet), or excessive dust.
- Place the cassettes in cassette cases and position vertically.
- To prevent accidental erasure, remove the cassette's safety tab. To record on a cassette whose safety tab has been removed, cover the hole with adhesive tape.

WARNING:
It should be noted that it may be unlawful to re-record pre-recorded tapes, records, or discs without the consent of the owner of copyright in the sound or video recording, broadcast, or cable program and in any literary, dramatic, musical, or artistic work embodied therein.

2-1 FRONT PANEL

Illustration shows BR-S800U



❶ POWER switch

POWER ON OFF — Turns the power ON or OFF. When power is ON, the time counter and level meters will be illuminated.

❷ Level meter section

[AUD-1/L] Audio-1/L-ch level meter

AUD-1/L — Indicates the audio level of the normal audio-1 or Hi-Fi left-channel signal during recording and playback. Hi-Fi/Normal is selectable with the AUDIO MONITOR Hi-Fi/NORMAL switch ❽.

[AUD-2/R] Audio-2/R-ch level meter/METER SELECT switch

AUD-2/R — Depending on the setting of the METER SELECT switch, this indication changes as shown below.

METER SELECT: RACKING / TRACKING / AUD-2/R

AUD-2/R: Indicates the audio level of the normal audio-2 or H-Fi right-channel signal during recording and playback.

TRACKING: Indicates video FM level as a tracking meter during playback.

❸ TRACKING control

TRACKING — Adjusts tracking. Turn in either direction during playback until the tracking meter deflects all the way to right. Functions as a V.Lock adjustment control in the Still mode and as a tracking adjustment control in slow-motion playback. (☞p.36)

❹ Cassette loading slot

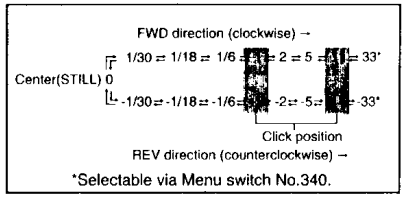
For insertion and removal of the video cassettes.

❺ Search dial

Used for search while in the Play or Still mode. The dial stays in the last set position even if the mode is changed during search.

Tape speed varies as shown below depending on the position the dial is turned to. (*Step slow mode)

*Slow mode is selectable via Menu switch No. 337.



*Selectable via Menu switch No.340.

2 CONTROLS, CONNECTORS AND DISPLAYS

2-1 FRONT PANEL

❻ Operation buttons

[AUD DUB] button (BR-S800U only)

Used for audio dubbing on the normal audio-2 track*.

To start audio dubbing: Press PLAY while pressing this button in the Play or Still mode. Audio dubbing will start and the AUD DUB indicator will light.

To temporarily stop audio dubbing: Press PAUSE/STILL.

To re-start audio dubbing: Press PLAY.

*Selectable via Menu switch No.208.

[REC] button (BR-S800U only)

To start recording: Press PLAY while pressing this button in the Stop mode. Recording will start and the REC and PLAY indicators will light.

To temporarily stop recording: Press PAUSE/STILL. The PAUSE/STILL indicator will light and recording will be paused.

To re-start recording: Press PLAY.

E-E function: When this button is pressed during playback, the monitor screen switches from the playback picture to the E-E picture so that the input signal can be monitored.

[PLAY] button

To start playback: Press in the Stop mode. Playback will start and the PLAY indicator will light.

To pause playback: Press PAUSE/STILL. The PAUSE/STILL indicator will light and a still picture will be produced.

To re-start playback: Press this button.

Reference pages

Audio dubbing p.41
Recording p.38
Playback p.34

MENU SWITCHES

In addition to switches on the front panel, the BR-S800U/BR-S500U incorporate a comprehensive set of Menu switches for more flexible VCR setup.

For setting items related to the functions described on this page, the following Menu switches are available.

Page reference

●Search
- No.204 Hi-Fi OUT AT SEARCH 30
- No.301 DIRECT SEARCH 31
- No.337 SLOW MODE 32
- No.340 SEARCH SPEED 32

●Audio dubbing
- No.208 AUDIO DUB SELECT 29
- No.339 A.DUB ENABLE AT LTC 32

●Recording

Servo
- No.003 SYNC SELECT 28
- No.004 AUTO H. PHASE 30

Video
- No.100 S-VHS SELECT 28
- No.101 EDIT SELECT 28

Audio
- No.200 Hi-Fi AUDIO REC 29
- No.201 NORM. AUDIO DOLBY NR 29
- No.202 AUDIO LIMITER 29
- No.205 AUDIO-1 REC 29
- No.206 AUD-2/LTC 30
- No.207 AUDIO INPUT SELECT 30
- No.208 AUDIO DUB SELECT 29
- No.339 A.DUB ENABLE AT LTC 32

System
- No.302 AUTO REC. PREROLL 31
- No.304 RECORDING INHIBIT 31
- No.305 REPEAT REC. 31

●Playback

Servo
- No.001 TBC CONNECT 30
- No.003 SYNC SELECT 28
- No.004 AUTO H. PHASE 30

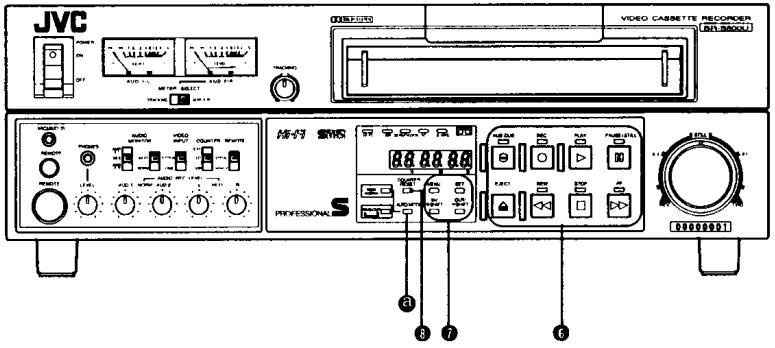
Video
- No.101 EDIT SELECT 28

Audio
- No.201 NORM. AUDIO DOLBY NR 29
- No.203 AUDIO OUT SELECT 30
- No.206 AUD-2/LTC 30

☞p.54 GLOSSARY: E-E picture

2-1 FRONT PANEL

Illustration shows BR-S800U



❻ Operation buttons

[PAUSE/STILL] button

During recording: Press to temporarily stop recording. The PAUSE/STILL indicator will light.

During playback: Press to produce a still picture. The PAUSE/STILL indicator will light.

During Still: Press to advance the frame.

[EJECT] button

To eject a cassette: Press in the Stop mode. The modes in which the cassette can be ejected are slectable via the Menu switch.

[REW] button

To rewind: Press this button. The REW indicator will light and the tape is rewound at 100X normal speed. Monitor screen switches to E-E picture during rewind. REW speed is selectable via the Menu switch.

[STOP] button

To stop the tape: Press this button. Tape stops and the STOP indicator lights. Monitor screen switches to E-E picture.

[FF] button

To fast forward: Press this button. The FF indicator will light and the tape is fast-forwarded at about 100X normal speed. Monitor screen switches to E-E picture during fast-forward. FF speed is selectable via the Menu switch.

MENU SWITCHES

In addition to switches on the front panel, the BR-S800U/BR-S500U incorporate a comprehensive set of Menu switches for more flexible VCR setup.
For setting items related to the functions described on this page, the following Menu switches are available.

Page reference

●**Eject**
No.300 DIRECT EJECT 31

●**REW/FF**
No.312 MODE AT TAPE END 31
No.319 TAPE MAX SPEED 31

☞p.54 GLOSSARY: E-E picture

2 CONTROLS, CONNECTORS AND DISPLAYS

2-1 FRONT PANEL

❼ Menu switch/Repeat play setting buttons

[MENU] button

To switch to Menu switch setting mode: Press this button.

To return to time counter: Press again.

To switch to Menu switch-2 setting mode: Press after setting Menu switch No.338 "MEMORY SW-2" to "OPEN".

To switch to hour meter display: Set Menu switch No.909. (☞p.17)

[SET] button

Sets data in Menu switch setting. Also used to set the repeat playback start or end point when pressed together with the IN/+SHIFT or OUT/–SHIFT button.

[IN/+SHIFT] button

During Menu switch setting: Press to advance Menu number.

In Repeat Playback mode: After Repeat Playback mode is engaged with the AUTO MODE button ❽, press SET together with this button to set the repeat playback start point.

[OUT/–SHIFT] button

During Menu switch setting: Press to reverse Menu number.

In Repeat Playback mode: After Repeat Playback mode is engaged with the AUTO MODE button ❽, press SET together with this button to set the repeat playback end point.

❽ COUNTER RESET button

To reset CTL time counter to "0:00:00": Press this button.

In Repeat Playback mode: Press this button to simultaneously reset playback start/end point. To reset the start point only, press this button while pressing IN/+SHIFT. To reset the out point only, press this button while pressing OUT/–SHIFT.

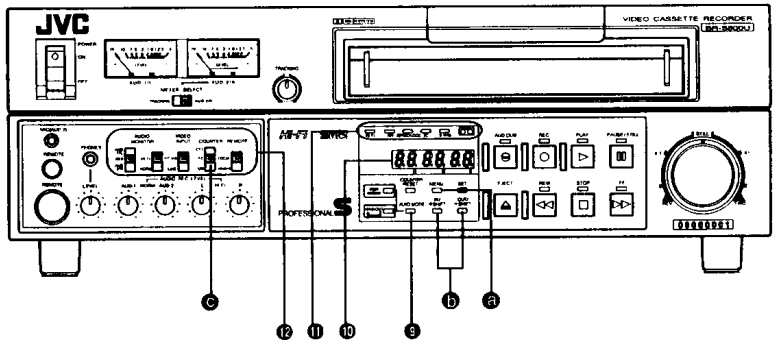
With timecode/user bit display: No effect.

Reference pages
Repeat playback p.37
Menu switch setting p.24
Hour meter display p.17

☞p.54 GLOSSARY: Hour meter

2-1 FRONT PANEL

Illustration shows BR-S800U



⓪ AUTO MODE button with indicators
[AUTO MODE] button

AUTO MODE

Each time this button is pressed, the auto operation mode changes as follows:

Counter search: Tape will automatically stop at counter "0:00:00" position during rewind or fast-forward.

Repeat playback: Engages repeat playback operation after start/end points have been entered.

No indicator light: No auto operation is engaged.

Counter search indicator

Lights when Counter Search mode is activated with AUTO MODE.

Repeat indicator

Lights when Repeat Playback is activated with AUTO MODE.

⓫ Counter display

Usually displays tape time, time code, and user bits. When the MENU button ⓐ is pressed, display changes to Menu switch setting. Also displays the preset repeat playback start or end point when the IN/+SHIFT or OUT/–SHIFT button ⓑ is pressed.

Counter mode: With the COUNTER switch ⓒ, the counter display changes as follows:
- CTL time counter
- CTL time code data
- CTL time code user bit data

When LTC/VITC board SA-R50U (optional) is installed: With the COUNTER switch ⓒ, the counter display changes as follows:
- CTL time counter
- LTC/VITC time code data
- LTC/VITC time code user bit data

Available display of each counter mode:

CTL time counter	–9:59:59 — 9:59:59 (hours, minutes, seconds)
CTL/LTC/VITC time code	00:00:00 — 23:59:59 (hours, minutes, seconds)
LTC/VITC user bit	00 00 00 — FF FF FF (First 6 digits can be displayed)
CTL user bit	00 00 — FF FF (All 4 digits can be displayed.)

Reference pages
- Counter search p.37
- Repeat playback p.37
- Displays p.16

☞ p.54 GLOSSARY: CTL, Time code, User bits

2 CONTROLS, CONNECTORS AND DISPLAYS

2-1 FRONT PANEL

⓫ LED indicators

[Hi-Fi] indicator

Hi-Fi

Lights when recording Hi-Fi audio or when playing back a Hi-Fi-recorded tape. Also lights in the E-E mode when the Menu switch No.200 "Hi-Fi AUDIO REC." is set to "ON".

[NR] indicator

NR

Lights when Dolby* NR is ON (via Menu switch No.201).

[SERVO LOCK] indicator

SERVO LOCK

Lights when the capstan and drum servos are locked to the reference sync signal during playback and recording.

[TC] indicator

TC

Lights when the Menu switch No.206 "LTC SELECT" is set to "LTC".

[S-VHS] indicator

S-VHS

Lights when an S-VHS tape is inserted. Also lights when recording in the S-VHS mode or when playing back an S-VHS-recorded tape.

Turns off when recording in the VHS mode or when playing back a VHS-recorded tape.

"Cassette loaded" indicator

Lights when a cassette is loaded.

MENU SWITCHES

In addition to switches on the front panel, the BR-S800U/BR-S500U incorporate a comprehensive set of Menu switches for more flexible VCR setup.
For setting items related to the functions described on this page, the following Menu switches are available.

Page reference

- **●Hi-Fi audio recording**
  No.200 Hi-Fi AUDIO REC. 29
- **●Dolby NR setting**
  No.201 NORM. AUDIO DOLBY NR ... 29
- **●LTC**
  No.206 AUD-2/LTC 30
- **●VHS recording with S-VHS tape**
  No.100 S-VHS SELECT 28

⓬ Setting switches

[AUDIO MONITOR] select switches

AUDIO MONITOR

Selects audio output for the PHONES jack and the AUDIO MONITOR OUT connector. Audio level meters will switch corresponding to the setting of the Hi-Fi/NORM switch.

Hi-Fi:	To monitor the Hi-Fi audio signals. Audio level meters switch to Hi-Fi audio level meters.
NORM:	To monitor the normal audio signals. Audio level meters switch to normal audio level meters
AUD-1/L:	To monitor the normal audio-1 or Hi-Fi left-channel signal.
MIX:	To monitor the AUD-1/L and AUD-2/R signals together. The stereo signal is output from the PHONES jack. Output of mixed normal audio and Hi-Fi audio signals is not possible.
AUD-2/R:	To monitor the normal audio-2 or Hi-Fi right-channel signal.

[VIDEO INPUT] select switch (BR-S800U only)

VIDEO INPUT

Selects an input video signal.

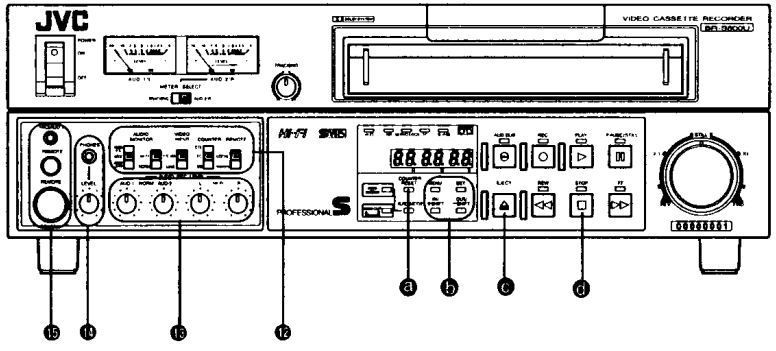
LINE:	To select the composite video signal input to the VIDEO IN LINE connector.
Y/C358:	To select the separate Y/C signal input to the VIDEO IN Y/C358 connector.

* Dolby noise reduction manufactured under license from Dolby Laboratories Licensing Corporation. "DOLBY" and the double-D symbol ⊡ are trademarks of Dolby Laboratories Licensing Corporation.

☞ p.54 GLOSSARY: E-E picture, Dolby NR, LTC

2-1 FRONT PANEL

Illustration shows BR-S800U



⓬ Setting switches

[COUNTER] select switch

COUNTER / CTL / TC / UB — Selects counter display mode.

CTL:	Tape time based on CTL signals is displayed in hours, minutes, and seconds. (–9:59:59 — 9:59:59)
TC:	When LTC/VITC board SA-R50U (optional) is not installed: CTL time code is displayed in hours, minutes, and seconds.
	When LTC/VITC board SA-R50U (optional) is installed: LTC or VITC time code is displayed in hours, minutes, and seconds.
UB:	When LTC/VITC board SA-R50U (optional) is not installed: CTL time code user bits (4-digit) are displayed.
	When LTC/VITC board SA-R50U (optional) is installed: LTC or VITC time code user bits (first 6 digits) are displayed.

CTL time counter is displayed, when the tape is played back in the EP mode, even if the COUNTER select switch is set to "TC".

[REMOTE] select switch

REMOTE / LOCAL / REMOTE — Selects between remote and local control of the VCR.

LOCAL:	For direct control with the VCR's function buttons. Remote control (optional) is not operative.
REMOTE:	For remote control via the optional remote control connected to the REMOTE connector.

When REMOTE is selected:
The COUNTER RESET button ⓐ, menu switch setting buttons ⓑ, the EJECT button ⓒ, and the STOP button ⓓ are still operative. All other switches and controls (except the COUNTER select switch and the search dial) become inoperative.

☞ p.54 GLOSSARY: CTL

2 CONTROLS, CONNECTORS AND DISPLAYS

2-1 FRONT PANEL

⓭ Audio recording level controls (BR-S800U only)
Adjusts recording levels separately for the Hi-Fi left/right-channel signals and the normal audio-1/2 signals.

⓮ Headphone jack with level control

[PHONES] jack
For headphone connection (M 3.5, stereo). The audio signal selected with AUDIO MONITOR can be monitored.

[LEVEL] control
Adjusts signal level output from the PHONES jack.

⓯ Microphone/Remote connectors

[MIC] jack (BR-S800U only)
For microphone connection (M 3.5, mono). Normal audio-2 signal switches from line to microphone.

[REMOTE] connector (RCA)
For serial remote connection. Connect a remote control RM-G30U (optional). Set the REMOTE switch to "REMOTE".

[REMOTE] connector (12-pin)
For editing control. Connect an editing controller RM-G800U (optional). Set the REMOTE switch to "REMOTE".

When both REMOTE connectors are connected to remote controls:
VCR can be controlled by either remote control (if the REMOTE switch is set to "REMOTE".)

MENU SWITCHES

In addition to switches on the front panel, the BR-S800U/BR-S500U incorporate a comprehensive set of Menu switches for more flexible VCR setup.
For setting items related to the functions described on this page, the following Menu switches are available.

Page reference

●Audio recording

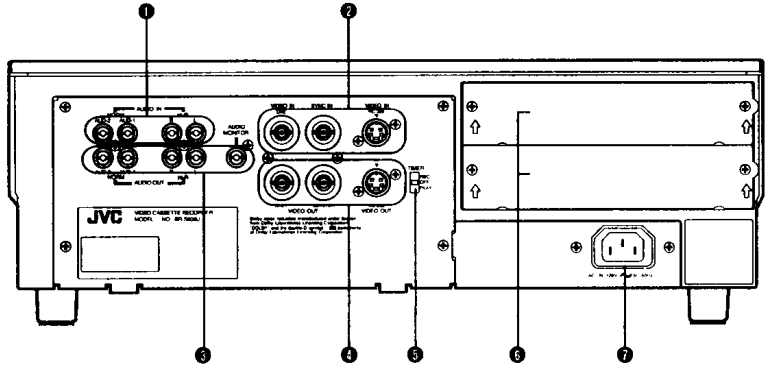
No.200 Hi-Fi AUDIO REC 29
No.201 NORM. AUDIO DOLBY NR ... 29
No.202 AUDIO LIMITER 29
No.205 AUD-1 REC 29
No.206 AUD-2/LTC 30
No.207 AUDIO INPUT SELECT 30
No.208 AUD DUB SELECT 29

●Audio playback

No.203 AUDIO OUTPUT SELECT 30
No.204 Hi-Fi OUT AT SEARCH 30

2-2 REAR PANEL

Illustration shows BR-S800U



❶ Audio input connectors

[AUDIO IN NORMAL] connectors (RCA) (BR-S800U only)
Accepts audio signals for recording on the normal audio track.

[AUDIO IN HI-FI] connectors (RCA) (BR-S800U only)
Accepts audio signals for recording on the Hi-Fi audio track*.
(*Selectable via Menu switch.)

❷ Video input connectors

[VIDEO IN LINE] connector (BR-S800U only)
Accepts composite video signals.

[SYNC IN] connector (BNC)
For reference sync signal input. Input the composite video or composite sync signal.

[VIDEO IN Y/C358] connector (4-pin)
Accepts separate Y/C signals.

❸ Audio output connectors

[AUDIO OUT NORMAL] connectors (RCA)
AUD-1 and AUD-2 normal audio signals are output.

[AUDIO OUT HI-FI] connectors (RCA)
Hi-Fi left/right-channel audio signals are output*.
(*Selectable via Menu switch.)

[AUDIO MONITOR] connector (RCA)
Outputs the audio signal selected with the front panel AUDIO MONITOR switch (☞p.11).

❹ Video output connectors

[VIDEO OUT LINE/MONITOR] connectors (BNC)
Outputs composite video signals. On-screen information is supplied from the MONITOR connector.

[VIDEO OUT Y/C358] connector (4-pin)
Outputs separate Y/C signals.

2-2 REAR PANEL

❺ TIMER switch
Selects timer mode when an external timer is connected.

REC (BR-S800U only): The VCR automatically starts recording when power is supplied from the timer.

OFF: No timer operation.

PLAY: The VCR automatically starts playback when power is supplied from the timer.

❻ Expansion slots
A variety of optional boards can be installed here to increase the unit's capabilities.

❼ AC IN socket
Connect to 120 V AC, 50/60 Hz power outlet using the provided power cord.

MENU SWITCHES

In addition to switches on the front panel, the BR-S800U/BR-S500U incorporate a comprehensive set of Menu switches for more flexible VCR setup.
For setting items related to the functions described on this page, the following Menu switches are available.

Page reference

●Audio input
No.205 AUD-1 REC. 29
No.206 AUD-2/LTC 30
No.207 AUDIO INPUT SELECT 30
No.208 AUD DUB SELECT 29
No.339 A.DUB ENABLE AT LTC 32

●Video input
No.003 SYNC SELECT 28

●Audio output
No.203 AUDIO OUTPUT SELECT 30
No.204 Hi-Fi OUT AT SEARCH 30
No.206 AUD-2/LTC 30

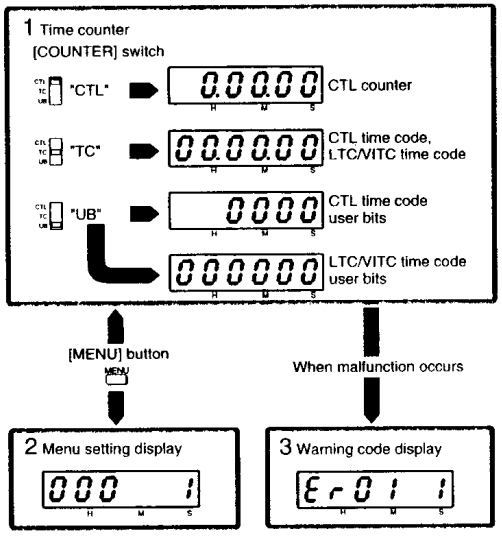
●Servo
No.001 TBC CONNECT 30
No.003 SYNC SELECT 28

●On-screen display
No.500 ON SCREEN DISPLAY 29
No.504 INFORMATION 33

Reference pages
External timer recording p.42
External timer playback p.38

☞p.54 GLOSSARY: Time code, LTC

2-3 DISPLAYS



Counter display

The BR-S800U/BR-S500U's counter is switchable between the following items.

1 Time counter
The counter usually functions as a tape time counter. If the MENU button is pressed, the counter changes to the Menu switch setting mode.

2 Menu setting display
For Menu switch setting. After setting Menu switches, press the MENU button to return to the tape time counter.

3 Warning code display
If a malfunction occurs, the corresponding numerical warning code is automatically displayed.

Time counter display
If the repeat playback start or end point has been set, the counter shows the start or end point when the IN/+SHIFT or OUT/–SHIFT button is pressed. (Setting the COUNTER switch to either "CTL" or "TC" is required.)

Reference pages
Menu switch setting p.24
Warning code display p.47

2-3 DISPLAYS

On-screen displays

On-screen information is available only via the rear panel VIDEO OUT MONITOR connector.

The following four display modes are available.

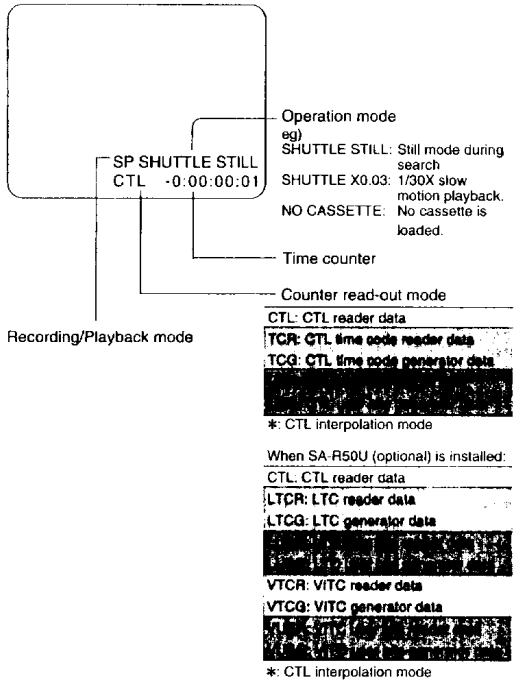
1 Mode displays/Time counter
Normal on-screen display. Time counter shows counter read-out data in hours, minutes, seconds, and frames. If the MENU button is pressed, the display changes to the Menu switch setting mode.
NOTE:
Due to the characteristics of the CTL time code, any discontinuity in existing CTL time code data (including user bits) during playback may result in an incorrect counter display reading for about two seconds at the point where the data changes.

2 Menu setting display
For Menu switch setting. After setting Menu switches, press the MENU button to return to the normal on-screen display.

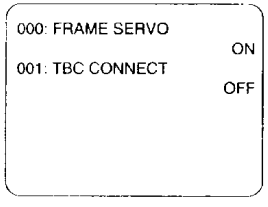
3 Hour meter data display
In the Menu setting mode, hour meter data is shown with Menu switch No.909. (Hour meter data is not displayed on the counter.)

4 Warning code display
If a malfunction occurs, the corresponding warning code is automatically displayed.

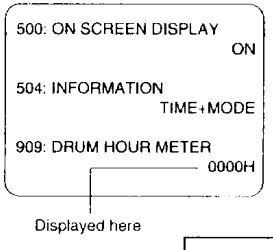
1 Mode displays/Time counter



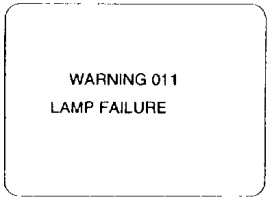
2 Menu setting display



3 Hour meter data display

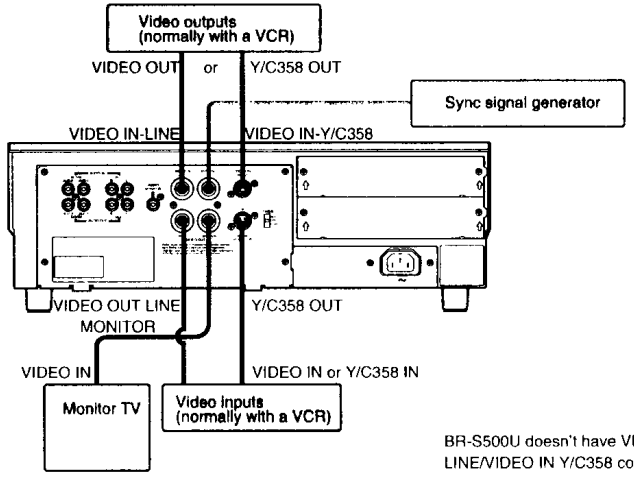


4 Warning code display



Reference pages
Menu switch setting p.24
Warning code display p.47

3-1 VIDEO SIGNAL



BR-S500U doesn't have VIDEO IN LINE/VIDEO IN Y/C358 connectors.

Connection with a monitor

On-screen information can only be output from the VIDEO OUT MONITOR connector. So connect a monitor to it.

Y/C 358 connectors

If the units you're connecting to have Y/C 358 connectors, we recommend you use the Y/C connection to make the most of S-VHS picture performance.

Type of connectors

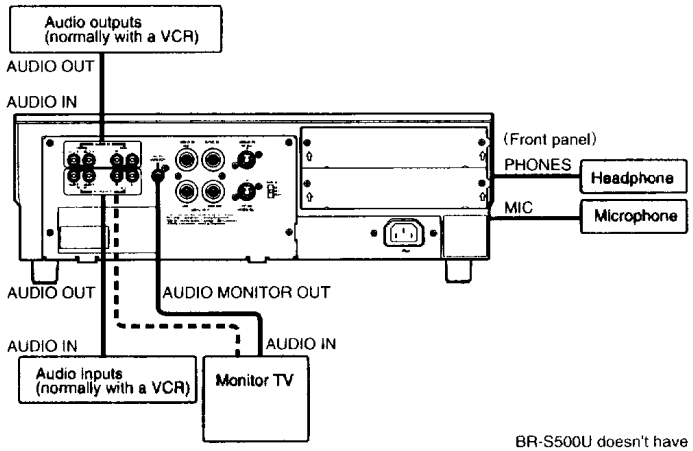
INPUT:	VIDEO IN LINE	BNC
	VIDEO IN Y/C358	4-PIN
	SYNC IN	BNC
OUTPUT:	VIDEO OUT LINE/MONITOR	BNC
	VIDEO OUT Y/C 358	4-PIN

Optional cables

A variety of optional cables suitable for different applications are available for Y/C connection.

Model	Connectors on connected units Output	Input	length
VC-G30U	4-pin	4-pin	3 m
VC-G50U	4-pin	4-pin	5 m
VC-G3030U	4-pin	7-pin	3 m
VC-G2030U	7-pin	4-pin	3 m
VC-G2050U	7-pin	4-pin	5 m

3-2 AUDIO SIGNAL



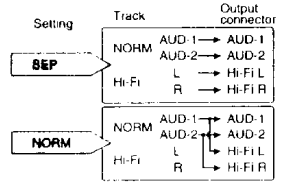
BR-S500U doesn't have MIC/AUDIO IN connectors.

Connection with a monitor

The audio signal output from the AUDIO MONITOR OUT connector is monaural. Select the signal to be output with the front panel AUDIO MONITOR switch (☞p.11).

Menu switch No.203 "AUDIO OUTPUT SELECT" setting

At the factory, the unit is preset to output Hi-Fi audio from Hi-Fi AUDIO OUT and normal audio from NORMAL AUDIO OUT. With Menu switch setting, normal audio can be output both from Hi-Fi AUDIO OUT and NORMAL AUDIO OUT. This is convenient when you want to output two channels of stereo normal audio signals. (☞p.30)

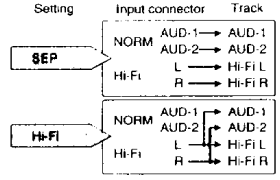


Menu switch No.204 "Hi-Fi OUT AT SEARCH" setting

With Menu switch setting, normal audio can be output during search or during plyaback of a tape with no Hi-Fi audio signals. (☞p.30)

Menu switch No.207 "AUDIO INPUT SELECT" setting (BR-S800U only)

At the factory, the unit is preset to record the signal input to Hi-Fi AUDIO IN on the Hi-Fi audio track and the signal input to NORMAL AUDIO IN on the normal audio track. With Menu switch setting, the signal input to Hi-Fi AUDIO IN can be recorded both on the Hi-Fi and normal audio tracks. This is convenient when you want to record the same signal on the Hi-Fi and normal audio tracks. (☞p.30).



Type of connectors

Front panel:

PHONES: ø 3.5 mini-jack (stereo)

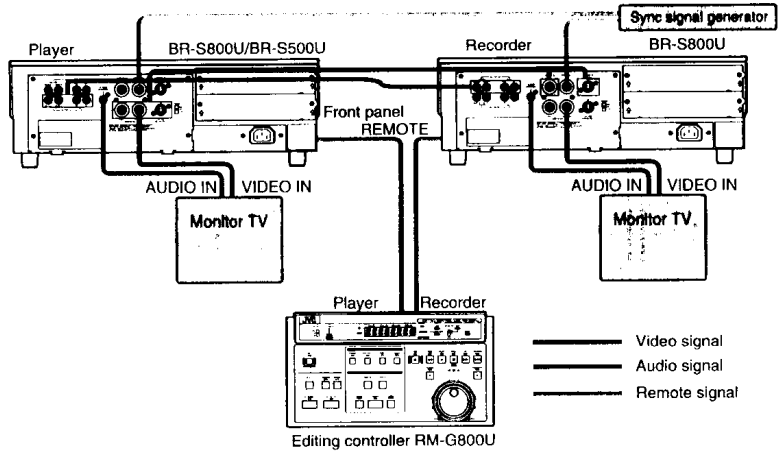
MIC: ø 3.5 mini-jack (monaural)

Rear panel:

All connectors are RCA type.

3-3 EDITING

Connection example when using RM-G800U (optional).



This is a standard editing system in combination with the optional editing controller RM-G800U.

NOTE:

To connect the remote cable, be sure that the power of the VCR is turned off.

External sync signal

By inputting an external sync signal, you can ensure that the Recorder's picture remains stable even when special effects playback is engaged in the Player. Use a composite sync signal or a composite video signal for external sync.

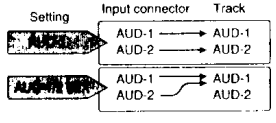
Extension remote cable (optional)

The RM-G800U's cable is about 85 cm long. If you want to extend the cable, use the optional VC-G8030U cable (3 m).

Menu switch No.205 "AUD-1 REC." setting (BR-S800U only)

The signals input to AUDIOIN NORM AUD-1 and AUD-2 can be mixed and be recorded on the audio-1 track. (☞p.29)

To permit later insertion of BGM or narration on the recorder's AUD-2 track, use this setting to mix the player's audio output (AUD-1 and AUD-2) and record both signals on the recorder's AUD-1 track.



3-3 EDITING

Editing system with other optional editing controllers

In addition to the RM-G800U, the following editing controllers can also be used in a BR-S800U/BR-S500U editing system. Depending on which controller you use, some optional boards and special settings may be necessary. See below.

With RM-86U:

- SA-K28UA 45-pin interface board.
- Set Menu switches No.330 "VIDEO EDIT DELAY" and No.331 "AUDIO EDIT DELAY" to "4 FRAMES". THe RM-86U's edit timing cannot be set to "-4 FRAMES". Set it to "-3 FRAMES". For setting procedures , consult your local JVC dealer.(☞p.32)
- Set Menu switches No.319 "TAPE MAX SPEED" and No.340 "SEARCH SPEED" to "X17". (☞p.32)
- CTL time code editing is not possible.
- Normal audio may overlap for a few frames after the edit-in point.

With RM-G810U:

- SA-K28UA 45-pin interface board.
- CTL time code editing is not possible.
- Set the RM-G810U's "EDIT TIMING ADJUSTMENT" to "–8 FRAMES". For setting procedures, consult your local JVC dealer.

With RM-G860U:

- SA-K28UA 45-pin interface board or SA-K26U 9-pin interface board.
- CTL time code editing is possible with the SA-K26U installed. (CTL time code setting is not possible.)
- Set the RM-G860U's "EDIT TIMING ADJUSTMENT" to "–8 FRAMES".

With RM-G870U:

- SA-K26U 9-pin interface board.
- CTL time code editing is possible.
- Set the RM-G870U's "EDIT TIMING ADJUSTMENT" to "–8 FRAMES".

When LTC/VITC (SMPTE) time code is required:

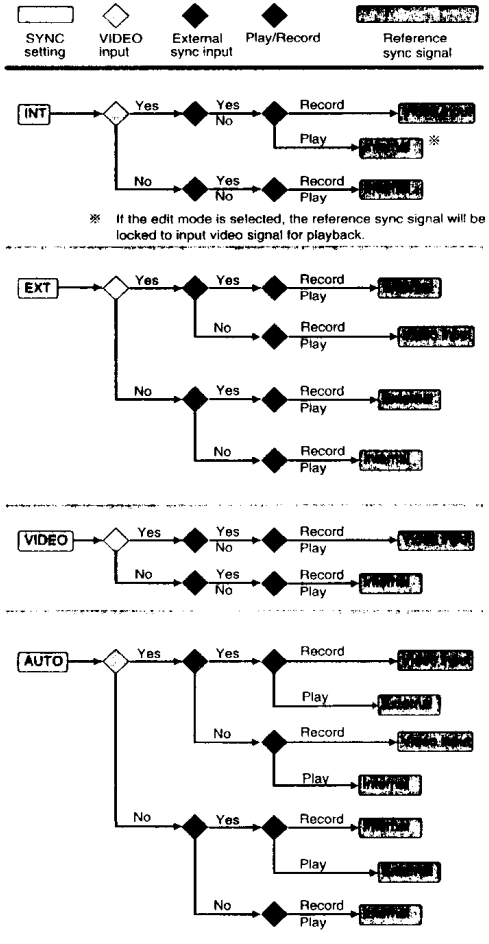
- SA-R50U time code reader/generator board. When installing the SA-R50U, the SA-K50U adapter board is necessary. When installing the SA-R50U by attaching it to the SA-K26U, the SA-K50U is not necessary.

When connecting to a computer:

- SA-K27UA RS-232C interface board.
- Use "cross-type" RS-232C cable to connect the SA-K27UA with a computer.

Reference pages
Optional accessories p.52

3-4 REFERENCE SYNC SIGNALS SETTING



Reference sync signals for recording and playback

Sync signal:
A sync signal is essential for stable VCR tape running. Playback and recording are based on the sync signal.

Sync signal variation:
The BR-S800U/BR-S500U can use any of the following types of signal as a reference sync signal.

1. Sync signal generated by the VCR's internal sync signal generator.
2. Input video signal applied to the VIDEO IN connector.
3. External sync signal applied to the SYNC IN connector
4. Advanced sync signal from TBC applied to the SYNC IN connector.

Menu switch related to sync signal setting:
Reference sync signal can be set via Menu switch No.003 "SYNC SELECT". (☞p.28)

Settings

INTERNAL: Locked to the sync signal from the built-in sync signal generator for playback, and locked to the input video signal for recording.

EXTERNAL: Locked to the external sync signal.

VIDEO (BR-S800U only): Locked to the input video signal.

AUTO (BR-S800U only): Locked to the input video signal for recording, and locked to the external sync signal for playback.

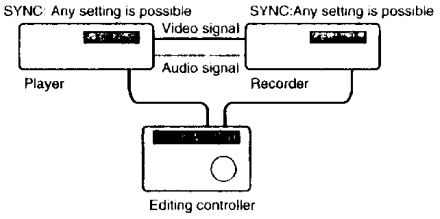
Factory preset:
BR-S800U: "AUTO"
BR-S500U: "INTERNAL"

Sync signal selection structure:
If the sync signal selected via Menu switch above is not supplied, the VCR will choose another signal for sync depending on the situation. This is described in the flowchart at left.

Reference pages
Menu switch setting p.25

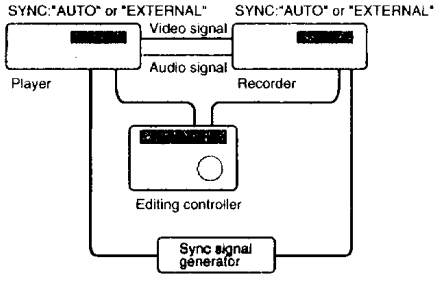
3-4 REFERENCE SYNC SIGNALS SETTING

Guide to reference sync signal setting:

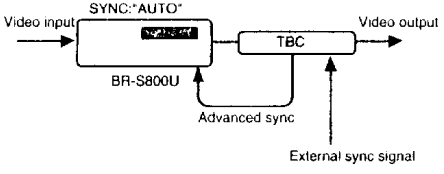


- **Editing system**
  - When external sync is not applied:
    Player: Any setting is possible.
    Recorder: Any setting is possible.

    NOTE: When special effects playback is engaged in the Player, the Recorder's picture may be distorted. This is not a malfunction. To prevent this, use external lock.



  - When external sync is applied:
    Player: "AUTO" or "EXTERNAL".
    Recorder: "AUTO" or "EXTERNAL".



- **Recording/transmission system using an external TBC**
  - BR-S800U:
    When using the BR-S800U for both recording and feeding purposes:
    "AUTO".
    When using the BR-S800U as a feeder only : "AUTO" or "EXTERNAL".
  - BR-S500U:
    "EXTERNAL".

  NOTE: Set Menu switch No.001 "TBC CONNECT" to "ON". (☞p.30)

Reference pages
Menu switch setting p.25

4-1 MENU SWITCH ORGANIZATION

Menu switches

In addition to the front panel switches, the BR-S800U/BR-S500U incorporate various On-Screen Menu switches which can be set referring to the monitor screen or counter display. The Menu switch setting data is stored in the VCR's internal memory and remains even after the power is turned off.

Menu switch hierarchy

Levels

Due to the variety and complexity of the setting items available via the Menu switches, the switches have been divided into two levels to simplify easier operation.

Menu switch-1: Switches initially available.
These are switches which may be used more frequently such as normal audio Audio Limiter ON/OFF, Dolby NR ON/OFF, etc.

Menu switch-2: Switches available when Menu switch-1 No.338 "MENU SW 2" is set to "OPEN".
These are switches which may be used less frequently than switch-1. At the factory, Menu switch No.338 "MENU SW 2" is preset to "CLOSE". Set it to "OPEN" to activate switch-2 settings.

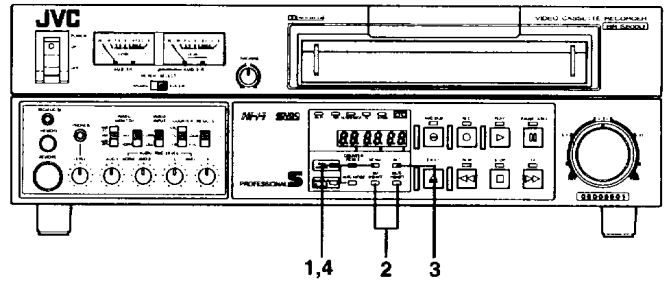
Category

The Menu switches in each level are separated into the following categories as shown at left.

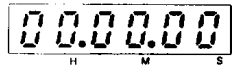
- **Servo**
  Menu switches No.000 — 004
- **Video**
  Menu switches No.100 — 101
- **Audio**
  Menu switches No.200 — 208
- **System**
  Menu switches No.300 — 351
- **On-screen**
  Menu switches No.500 — 504

4-2 SETTING PROCEDURE

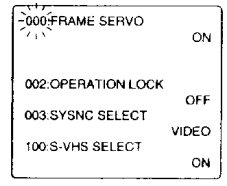
Illustration shows BR-S800U

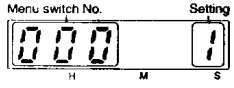


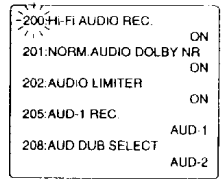
Counter display

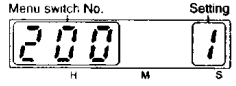


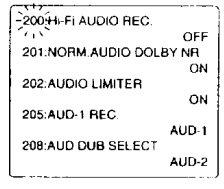
Monitor screen

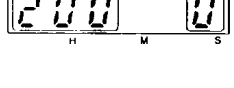


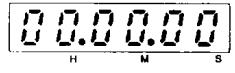












Hour meter display:
Hour meter data can be displayed only on-screen with Menu switch No.909. It cannot be displayed on the counter.

Operation

1 Engage the Menu switch setting mode.
MENU Press the MENU button.
→ Counter display and monitor screen change to the Menu switch setting mode.

2 Select the switch item to be set.
IN/+SHIFT OUT/–SHIFT Press either the IN/+SHIFT or OUT/–SHIFT button to select desired item.
The selected item will start blinking on the monitor screen.

3 Change the setting of the selected item.
SET Press the SET button to set data as desired.
If you want to set another item, repeat steps 2 to 3.

4 End Menu switch setting.
MENU Press the MENU button. The Counter display returns to the tape counter and the Menu setting display goes off the screen.

☞ p 54 GLOSSARY: Hour meter

4-3 MENU SWITCH LIST

● SERVO		No.	On-screen Description	Explanation	Page
SW-1	*	000	FRAME SERVO	Frame servo ON/OFF	28
		002	OPERATION LOCK	Mode lock ON/OFF	28
		003	SYNC SELECT	Reference sync signal selection	28
SW-2		001	TBC CONNECT	TBC ON/OFF (If connected)	30
		004	AUTO H. PHASE	Auto H-phase circuit ON/OFF	30

● VIDEO		No.	On-screen Description	Explanation	Page
SW-1	*	100	S-VHS SELECT	S-VHS recording with an S-VHS tape ON/OFF	28
		101	EDIT SELECT	Recording/playback picture quality selection	28

● AUDIO		No.	On-screen Description	Explanation	Page
SW-1	*	200	Hi-Fi AUDIO REC.	Hi-Fi audio recording ON/OFF	29
		201	NORM. AUDIO DOLBY NR	Dolby NR ON/OFF for normal audio	29
	*	202	AUDIO LIMITER	Audio limiter ON/OFF for normal audio	29
	*	205	AUD-1 REC.	Signal selection to be recorded on the audio-1 track	29
	*	208	AUD DUB SELECT	Soundtrack selection for audio dubbing	29
SW-2		203	AUDIO OUTPUT SELECT	Selects the signal output from AUDIO OUT	30
		204	Hi-Fi OUT AT SEARCH	Selects the signal output from AUDIO OUT Hi-Fi during search	30
		206	AUD-2/LTC	Selects the signal to be recorded on the audio-2 track	30
	*	207	AUDIO INPUT SELECT	Selects the signal to be recorded on the AUD-1/2 tracks	30

● SYSTEM		No.	On-screen Description	Explanation	Page
SW-1		338	MENU SW 2	For Menu switch-2 items setting	29
SW-2		300	DIRECT EJECT	Mode selection for Eject	31
		301	DIRECT SEARCH	Mode selection for Search	31
	*	302	AUTO REC. PREROLL	Back space function ON/OFF in the Record-Pause mode	31
	*	304	RECORDING INHIBIT	Inhibits recording on cassettes with safety tab	31
	*	305	REPEAT REC.	Repeat recording ON/OFF	31
		312	MODE AT TAPE END	Mode selection when tape end is detected	31
		319	TAPE MAX SPEED	Maximum tape speed selection for rewind and fast-forward	32
	*	330	VIDEO EDIT DELAY	Delay time selection for video signals at edit point in editing	32
	*	331	AUDIO EDIT DELAY	Delay time selection for audio signals at edit point in editing	32
		337	SLOW MODE	Slow-motion mode selection	32
	*	339	A.DUB ENABLE AT LTC	Audio dubbing on LTC-recorded audio-2 track	32
		340	SEARCH SPEED	Maximum search speed selection	32
		343	SUB WARNING INHIBIT	Mode selection when a malfunction occurs	32
		351	SYNCHRONIZATION	Capstan bump ON/OFF with the editing controller	33

● ON-SCREEN		No.	On-screen Description	Explanation	Page
SW-1		500	ON SCREEN DISPLAY	On-Screen ON/OFF	29
SW-2		504	INFORMATION	Available on-screen information selection	33

*: Not available with BR-S500U.

4-3 MENU SWITCH LIST

A Quick Reference Chart Of Menu Switches

	Menu switch No.338 "MENU SW 2" is "CLOSE". (Initial setting)		Menu switch No.338 "MENU SW 2" is "OPEN".	
SERVO	000	FRAME SERVO	001	TBC CONNECT
	002	OPERATION LOCK	004	AUTO H. PHASE
	003	SYNC SELECT		
VIDEO	100	S-VHS SELECT		
	101	EDIT SELECT		
AUDIO	200	Hi-Fi AUDIO REC.	203	AUDIO OUTPUT SELECT
	201	NORM. AUDIO DOLBY NR	204	Hi-Fi OUT AT SEARCH
	202	AUDIO LIMITER	206	AUD-2/LTC
	205	AUD-1 REC.	207	AUDIO INPUT SELECT
	208	AUD DUB SELECT		
SYSTEM	338	MENU SW 2	300	DIRECT EJECT
			301	DIRECT SEARCH
			302	AUTO REC. PREROLL
			304	RECORDING INHIBIT
			305	REPEAT REC.
			312	MODE AT TAPE END
			319	TAPE MAX SPEED
			330	VIDEO EDIT DELAY
			331	AUDIO EDIT DELAY
			337	SLOW MODE
			339	A. DUB ENABLE AT LTC
			340	SEARCH SPEED
			343	SUB WARNING INHIBIT
			351	SYNCRONIZATION
ON-SCREEN	500	ON SCREEN DISPLAY	504	INFORMATION

The following Menu switches are available only with the BR-S800U and not with the BR-S500U.

- No.000 FRAME SERVO*
- No.100 S-VHS SELECT
- No.200 Hi-Fi AUDIO REC.
- No.202 AUDIO LIMITER
- No.205 AUD-1 REC.
- No.207 AUDIO INPUT SELECT
- No.208 AUD DUB SELECT
- No.302 AUTO REC. PREROLL
- No.304 RECORDING INHIBIT
- No.305 REPEAT REC.
- No.330 VIDEO EDIT DELAY
- No.331 AUDIO EDIT DELAY
- No.339 A. DUB ENABLE AT LTC

*Frame servo is always "ON" with the BR-S500U.

4-4 MENU SWITCH-1 ITEMS

More frequently used switches are available with SWITCH-1.

SWITCH-1 SERVO

No.000 FRAME SERVO

Setting: OFF (0).....Frame Servo OFF.
●ON (1) .....Frame Servo ON.
Content: Activates or defeats Frame Servo. Normally set to ON. If the servo is unstable when the following signals are used, set to OFF.
Not frame-controlled signals
Low video S/N signals after repeated dubbing.

No.002 OPERATION LOCK

Setting: ●OFF (0).....Operate lock OFF.
ON (1) .....Operate lock ON.
Content: Activates or defeats mode lock function. Set to ON to lock the VCR in its current mode.
When set to ON: All buttons, switches, and controls are inoperative except menu setting buttons, the METER SELECT switch, PHONES LEVEL control, and the POWER switch.
The TRACKING control and the audio reacording level controls are rendered inoperative. Because the values for these controls are determined by the last-set position, any adjustment made to these controls while the unit is in the operation lock status will take effect the next time off and then on again.. If this happens, set the operation lock to "OFF" and adjust the controls as desired.

No.003 SYNC SELECT

Setting: INTERNAL (0) .....Internal lock.
EXTERNAL (1) .....External lock.
VIDEO (2).....Input video signal
●AUTO (3) .....Auto switching
Content: Selects the reference sync signal for playback and recording.
INTERNAL: Locked to the internal sync signal.

EXTERNAL: Locked to the external sync signal.

VIDEO: Locked to the input video signal.

AUTO: Locked to the input video signal for recording. Locked to the advanced sync signal from TBC for playback. Use this setting when the unit is used as recorder and a TBC is connected.

For details, ☞p.22.

(For the BR-S500U, only INTERNAL and EXTERNAL are available. Factory preset is INTERNAL.)

SWITCH-1 VIDEO

No.100 S-VHS SELECT

Setting: VHS (0) .....S-VHS recording OFF.
●AUTO (1) ....S-VHS recording ON.
Content: Selects the S-VHS/VHS recording mode when using an S-VHS tape. Set to VHS to record in the VHS mode with an S-VHS tape. When a VHS tape is used, the recording mode is VHS regardless of the setting.

No.101 EDIT SELECT

Setting:● OFF(P.B.) (0)..... Playback with normal picture.
DUB or EDIT (1)....When used as Player or Recorder in dubbing or editing.
ENHANCED (2).....Playback with sharper picture edges
CNR OFF (3).....Deactivates the CNR circuit during playback.
Content: Selects the type of playback picture for playback or recording. Set to DUB or EDIT in dubbing or editing to reduce deterioration of picture quality.
•Set to "CNR OFF" when vertical color blur is noticeable.

●: Factory preset
( ): Display on the counter

☞p.54 GLOSSARY: Frame servo, TBC, Advanced sync

4-4 MENU SWITCH-1 ITEMS

SWITCH-1 AUDIO

No.200 Hi-Fi AUDIO REC.

Setting: OFF (0).....Hi-Fi audio recording OFF.
●ON (1) .....Hi-Fi audio recording ON.
Content: Activates or defeats Hi-Fi audio recording.

No.201 NORM. AUDIO DOLBY NR

Setting: OFF (0).....Dolby NR OFF.
●ON (1) .....Dolby NR ON.
Content: Activates or defeats Dolby NR circuit for normal audio in recording and playback.

No.202 AUDIO LIMITER

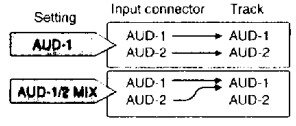
Setting: OFF (0).....Audio limiter OFF.
●ON (1) .....Audio limiter ON.
Content: Activates or defeats audio limiter for normal audio.

No.205 AUD-1 REC.

Setting:●AUD-1 (0) .....Records audio-1 signals.
AUD-1/2 MIX (1)...Records mixed audio signals.
Content: Selects audio signals to be recorded on the normal audio-1 track.

AUD-1: Audio signals input to AUD-1 are recorded.

AUD-1/2 MIX: Mixed audio signals input to AUD-1 and AUD-2 are recorded. No signal is recorded on the audio-2 track.



When set to "AUD-1/2 MIX", the microphone input signal is mixed with the signal input to the AUD-1 connector and recorded on the AUD-1 track.

No.208 AUD DUB SELECT

Setting: AUD-1 (0) .....Records on the audio-1 track.
●AUD-2 (1) .....Records on the audio-2 track.
AUD-1/2 (3) ...Records on both tracks.
Content: Selects the soundtrack for audio dubbing.
AUD-1: The signal is recorded on the audio-1 track.

AUD-2: The signal is recorded on the audio-2 track.

AUD-1/2: The signal is recorded both on the audio-1 and audio-2 tracks.

To dub a microphone input signal on the AUD-1 track, set this switch to "AUD-1" and set the menu switch No.205 "AUD-1 REC" to "AUD-1/2 MIX".

SWITCH-1 SYSTEM

No.338 MENU SW 2

Setting: ●CLOSE (0)..Menu switch-2 not available.
OPEN (1)....Menu switch-2 available.
Content: Activates or defeats Menu switch-2 items.

CLOSE: Only Menu switch-1 items are available.

OPEN: Both Menu switch-1 and Menu switch-2 items can be set.

SWITCH-1 ON-SCREEN

No.500 ON SCREEN DISPLAY

Setting: OFF (0).....On-Screen display OFF.
●ON (1) .....On-Screen display ON.
Content: Activates or defeats On-Screen display via VIDEO OUT MONITOR. On-Screen display is not available via VIDEO OUT LINE or Y/C.

☞p.54 GLOSSARY: Dolby NR, Audio limiter

4-5 MENU SWITCH-2 ITEMS

SWITCH-2 SERVO

No.001 TBC CONNECT

Setting: ●OFF (0) ..... When TBC is not connected.
ON (1) ..... When TBC is connected.
Content: Set to ON when an external TBC is connected.

No.004 AUTO H. PHASE

Setting: OFF (0) ..... Auto H-Phase OFF.
●ON (1) ..... Auto H-Phase ON.
Content: Activates or defeats Auto H-Phase (automatic horizontal phase lock) circuit. Normally set to ON to reduce picture distortion at the edit point. When executing frame-unit editing repeatedly, set to OFF.

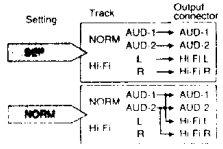
SWITCH-2 AUDIO

No.203 AUDIO OUTPUT SELECT

Setting: ●SEP (0) ..... Outputs as labeled.
NORM (2) ... Outputs only normal audio signals.
Content: Selects signals output via rear panel AUDIO OUT connectors.

SEP: To output as labeled: normal audio from AUD-1/AUD-2, Hi-Fi audio from Hi-Fi L/R.

NORM: To output normal audio from all connectors: Hi-Fi L outputs normal audio-1 signal and Hi-Fi R outputs normal audio-2 signal.



No.204 Hi-Fi OUT AT SEARCH

Setting: ●MUTE (0) .... Outputs muted Hi-Fi audio.
NORM (1) ... Outputs normal audio.
Content: Selects output signals between muted Hi-Fi audio and normal audio via rear panel Hi-Fi AUDIO OUT connectors during search or during playback of a tape with no Hi-Fi audio signals.

No.206 AUD-2/LTC

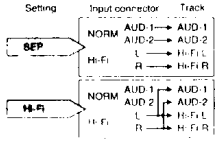
Setting: ●AUD-2 (0) ... Records the audio signal.
LTC (1) ..... Records LTC signal.
Content: Selects usage of the audio-2 track either for audio signal recording or for LTC signal recording. When set to "LTC", no audio signal is output from the NORM AUD-2 connector.
Be sure that the VCR is in the Stop mode when switching between AUD-2 and LTC.

No.207 AUDIO INPUT SELECT

Setting: ●SEP (0) ..... Records each signal independently.
Hi-Fi (1) ..... Records Hi-Fi audio on all tracks.
Content: Selects input signal to be recorded.

SEP: To record each signal on corresponding track: normal audio on AUD-1/AUD-2, Hi-Fi audio on Hi-Fi L/R.

Hi-Fi: To record Hi-Fi audio on all tracks: audio-1 signal is recorded on Hi-Fi L track and audio-2 signal is recorded on Hi-Fi R track.



●: Factory preset
( ): Display on the counter

☞ p.54 GLOSSARY: Auto H-phase, LTC

4-4 MENU SWITCH-1 ITEMS

SWITCH-2 SYSTEM

No.300 DIRECT EJECT

Setting: DISABLE (0) ... Only possible in the Stop mode.
●ENABLE (1) .... Possible in any mode.
Content: Selects modes in which the cassette can be ejected.

DISABLE: Ejection only possible in the Stop mode.

ENABLE: Ejection possible in any mode.

No.301 DIRECT SEARCH

Setting: DISABLE (0) ... Possible in the Still modes.
●ENABLE (1) .... Possible in various modes.
Content: Selects modes to accept dial search.

DISABLE: Dial search is possible in the Still mode.

ENABLE: Dial search is possible in the Still, Play, Stop, REW, and FF modes.

No.302 AUTO REC. PREROLL

Setting: DISABLE (0) .... No preroll operation.
●ENABLE (1) ..... Preroll operation.
Content: Activates or defeats back space editing.

DISABLE: Starts recording without prerolling in the Record-Pause or Audio Dub-Pause mode. Picture will be distorted at record-start point.

ENABLE: Starts recording with preroll in the Record-Pause or Audio Dub-Pause mode. Picture won't be distorted.

No.304 RECORDING INHIBIT

Setting: ●OFF (0) ..... Normal recording is possible
ON (1) ..... Recording is not possible.
Content: OFF: Recording is possible with cassettes with safety tab in place.

ON: Recording is not possible whether there is a safety tab or not. If the VCR is used only as a player, set to ON to prevent misoperation.

No.305 REPEAT REC.

Setting: ●DISABLE (0) .... No repeat recording.
ENABLE (1) ..... Engages repeat recording.
Content: Activates or defeats repeat recording.

DISABLE: No repeat recording. The VCR stops recording at tape end. Normally set to this position.

ENABLE: Activates repeat recording. The VCR stops recording at tape end, then rewinds and starts recording again from the beginning of the tape.

No.312 MODE AT TAPE END

Setting: ●S.REW (0) .. Stops at tape end.
REW (1) ..... Stops at tape begin after Rewind.
Content: Selects the mode entered when the end of the tape is detected.

S.REW: Rewinds the leader section and enters the Stop mode.

REW: Rewinds to the beginning of tape and enters the Stop mode.

No.319 TAPE MAX SPEED

Setting: ●X100 (0) ..... 100X normal speed.
X33 (1) ..... 33X normal speed.
X17 (2) ..... 17X normal speed.
Content: Selects the maximum tape speed during Rewind and Fast-forward.

X100: Maximum speed is 100X. The remote control counter (optional) does not run if it is connected via 45-pin.

X33: Maximum speed is 33X. The remote control counter (optional) does not run if it is connected via 45-pin.

X17: Maximum speed is 17X.

Search is always executed at maximum 11 times normal speed with S-VHS-C or VHS-C cassette tape.

4-5 MENU SWITCH-2 ITEMS

No.330 VIDEO EDIT DELAY

Setting: ●8 FRAMES (0) .....Delays 8 frames.
4 FRAMES (1) .....Delays 4 frames.
Content: Selects the length of time before video recording starts at the edit point in editing. Normally set to "8 FRAMES". Set to "4 FRAMES" when the VCR is controlled via the RM-86U remote control.

No.331 AUDIO EDIT DELAY

Setting: ●8 FRAMES (0) .....Delays 8 frames.
4 FRAMES (1) .....Delays 4 frames.
Content: Selects the length of time before video recording starts at the edit point in editing. Normally set to "8 FRAMES". Set to "4 FRAMES" when the VCR is controlled via the RM-86U remote control.

No.337 SLOW MODE

Setting: LINEAR (0) .....Linear slow.
●STEP (1) .....Step slow.
Content: Selects slow-motion playback mode.

LINEAR: Noise bars appear during slow. Normal audio is output during slow. This setting is recommended for editing.

STEP: Noise bars don't appear during slow. No audio is output during slow.

No.339 A. DUB ENABLE AT LTC

Setting: ●DISABLE (0)....Dubbing is not possible.
ENABLE (1).....Dubbing is possible.
Content: Activates or defeats audio dubbing on the audio-2 track with LTC signals.

DISABLE: Audio dubbing is not possible if LTC signals have been recorded on the audio-2 track.

ENABLE: Audio dubbing is possible even though LTC signals have been recorded on the audio-2 track.

When set to "ENABLE" and audio dubbing is executed, prerecorded LTC signals are erased. If you don't want this, set Menu switch No.208 "AUD DUB SELECT" to "AUD-1" to execute audio dubbing on the audio-1 track.

No.340 SEARCH SPEED

Setting: ●X33 (0) .....+/– 33X search.
X17 (1) .....+/– 17X search.
Content: Selects the maximum search speed.

X33: Maximum search speed is +/– 33 times normal when the search dial is turned fully clockwise or counterclockwise. The remote control counter (optional) does not run if it is connected via 45-pin.

X17: Maximum search speed is +/– 17 times normal when the search dial is turned fully clockwise or counterclockwise.

Search is always executed at maximum 11 times normal speed with S-VHS-C or VHS-C cassette tape.

No.343 SUB WARNING INHIBIT

Setting: ●OFF (0).....Enters the Warning mode.
ON (1) .....Enters the Stop or Eject.
Content: Selects the mode entered when a malfunction is detected.

OFF: When a malfunction occurs, the VCR enters the Warning mode and displays a warning code on the counter and the monitor screen. See p.48 for warning codes.

ON: When a malfunction occurs, the VCR either stops or ejects the cassette depending on the nature of the problem. (☞p.48) Warning codes are not available with this setting. For safe operation, do not use this setting unnecessarily.

●: Factory preset
( ): Display on the counter

4-4 MENU SWITCH-1 ITEMS

SWITCH-2 SYSTEM

No.351 SYNCHRONIZATION

Setting: DISABLE (0)....Rejects Capstan bump.
●ENABLE (1).....Accepts Capstan bump.
Content: Accepts or rejects Capstan bump command from the editing controller.

DISABLE: Capstan bump is rejected in editing.

ENABLE: Capstan bump is accepted in editing. Increases editing accuracy.

SWITCH-2 ON-SCREEN

No.504 INFORMATION

Setting: TIME (0) .....Displays time counter.
●TIME+MODE (1) ..Displays time and mode.
Content: Selects the on-screen information to be displayed.

TIME: Time counter data is displayed.

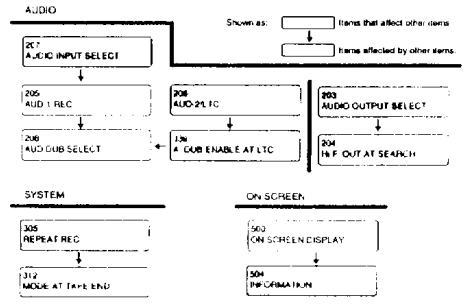
TIME+MODE: Time counter data, operation mode, and search speed are displayed.

●: Factory preset
( ): Display on the counter

4-6 RELATIONSHIP BETWEEN MENU SWITCHES

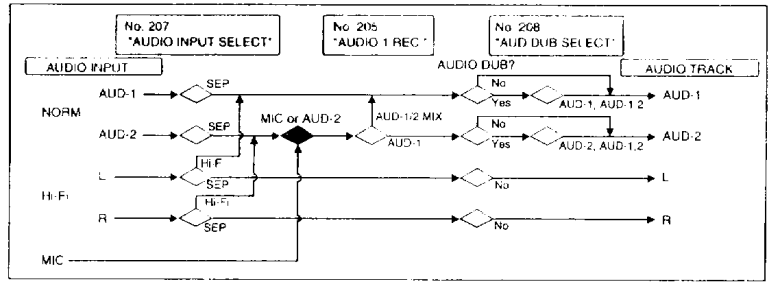
Relationship

Some Menu switches may affect the action of other Menu switches, depending on the settings. The relationship between switches is shown in the chart at right. When setting of a Menu switch does not work as expected, check to see if that setting is affected by other items.



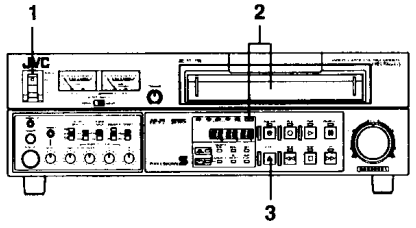
Input audio signal flowchart

The flowchart below describes how each audio input connector functions and shows how Menu switch settings determine on which track the input signal is recorded. A microphone input signal is normally recorded on the AUD-2 track. By setting Menu switch No.205 "AUD-1 REC" to "AUD-1/2 MIX", the MIC input signal can be recorded on the AUD-1 track together with the signal input to the AUD-1 connector.



5 LOADING/UNLOADING

LOADING AND UNLOADING



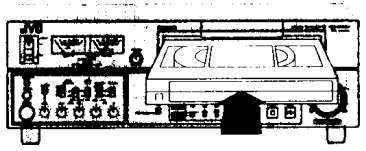
Procedure

1 Turn the power on.

POWER ON OFF Set the POWER switch to ON.

2 Insert a cassette.

Insert the cassette into the cassette loading slot by gently pushing the center of the cassette's label side.



→ The cassette is automatically retracted and loaded.
→ The VCR enters the Stop mode and the "Cassette loaded indicator" ⊡⊡ lights.

3 Remove a cassette.

⏏ Press the EJECT button.

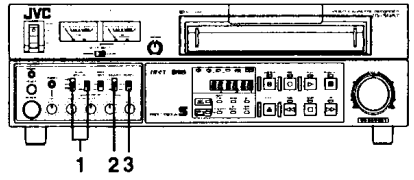
→ The cassette is automatically ejected.
→ Remove the cassette from the cassette loading slot.

WARNING

- Do not insert fingers or foreign objects into the cassette loading slot. You may hurt yourself or damage the mechanism.
- Do not try to remove the cassette once automatic loading has started.

6 PLAYBACK

6-1 PREPARATION



Front panel switch setting

1 Set the AUDIO MONITOR select switches as required. (☞p.11)

AUDIO MONITOR AUD TC MIX AUD 2/R HI-FI NORM

2 Set the COUNTER switch as required. (☞p.12)

COUNTER CTL TC UB

3 Set the REMOTE switch as required. (☞p.12)

REMOTE LOCAL REMOTE

Menu switch setting

Set the following items as required.

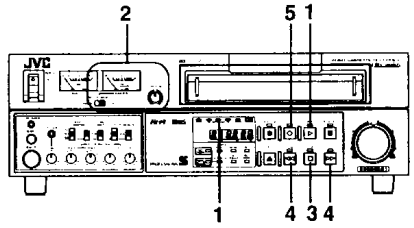
Select reference sync signal:
No.003 "SYNC SELECT" (☞p.28)
Factory preset: "AUTO" (BR-S800U)
"INTERNAL" (BR-S500U)

Select the type of picture:
No.101 "EDIT SELECT" (☞p.28)
Factory preset: "OFF"

Select TBC mode.
No.002 "TBC CONNECT" (☞p.30)
Factory preset: "OFF"
Set to "ON" when an external TBC is connected.

☞ p.54 GLOSSARY: TBC

6-2 BASIC PROCEDURE



Operation

1 Play back a tape.

▷ Press the PLAY button.
→ Starts playback.
→ The SERVO LOCK indicator lights.

SERVO LOCK

2 Adjust the tracking.

METER SELECT TRACKING AUD-2/R Turn the TRACKING control until the tracking meter (AUD-2/R) deflects fully to the right. Make sure that no noise bar appears on the monitor screen. If there is noise on the Hi-Fi audio track, turn the control until the noise is minimized.

AUD-2/R TRACKING

- Even if the TRACKING control is set to the center position, there may be some noise during playback of an EP-recorded tape. In this case, adjust the control as necessary to minimize the noise.

3 Stop playback.

□ Press the STOP button.
→ Playback stops.

4 Rewind or fast-forward the tape.

▷▷ Press the FF button.
→ Starts fast-forward.
◁◁ Press the REW button.
→ Starts rewind.

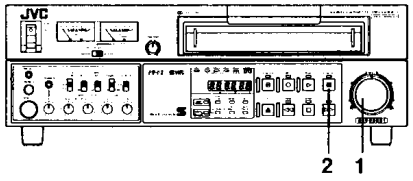
5 Input signal monitoring. (BR-S800U only)

◯ If the REC button is pressed during playback, the input signal can be monitored on screen as long as the button is pressed. Do not press the REC button while pressing the PLAY button, otherwise the VCR enters the Record mode.

Maximum REW/FF speed
Factory preset: 100X normal speed.
→ Other settings (33X, 17X) are possible via Menu switch. (No.319 "TAPE MAX SPEED", ☞p.32)

VCR mode at tape end
Factory preset: Enters the Stop mode at tape end.
→ This is selectable via Menu switch; the VCR automatically rewinds when the end of the tape is reached and then stops. (No.312 "MODE AT TAPE END" ☞p.31)

6-3 SPECIAL EFFECTS PLAYBACK

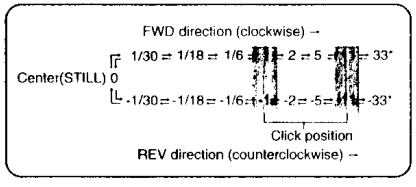


Operation

1 Dial search

Turn the dial while in the Play, Still, Stop, FF, or REW mode. Turn the dial clockwise to search in the forward direction and turn it counterclockwise to search in the reverse direction.

→ Starts search. Search speed varies as shown below (in the Step Slow mode).


FWD direction (clockwise) →
1/30 ⇄ 1/18 ⇄ 1/6 ⇄ 1 ⇄ 2 ⇄ 5 ⇄ 33
Center(STILL) 0
-1/30 ⇄ -1/18 ⇄ -1/6 ⇄ -1 ⇄ -2 ⇄ -5 ⇄ -33
Click position
REV direction (counterclockwise) ←

To end search: Press either of the PLAY, STOP, FF, REW button.

→ The VCR enters the mode corresponding to the button pressed. The dial remains in the same position.

To re-start search: Turn the dial again.

Maximum search speed

The factory preset maximum search speed is 33X. This can be changed to 16X via Menu switch No.340 "SEARCH SPEED". Set to "X17" to output CTL signals during search for readout on an optional 45-pin controller. (☞p.32)

DIRECT SEARCH setting

At the factory, Menu switch No.301 "DIRECT SEARCH" is preset to "ENABLE. When it is set to "DISABLE", the Search mode can be entered only from the Play and Still modes. (☞p.31)

2 Still/Frame advance

Press the PAUSE/STILL button in the Play mode.

→ Displays a still picture.

Press the PAUSE/STILL button again.

→ Advances the picture one frame at a time.

To resume normal playback: Press the PLAY button.

Slow motion mode setting

Menu switch No.337 "SLOW MODE"
Setting: "STEP" or "LINEAR"
Factory preset: "STEP"
The mode setting for slow-motion playback. The factory preset is set to "STEP" for noiseless slow motion. (☞p.32)

NOTE:When playing back an EP-recorded tape, set the slow motion mode to "LINEAR". If the slow motion mode is set to "STEP", the counter may not run correctly.

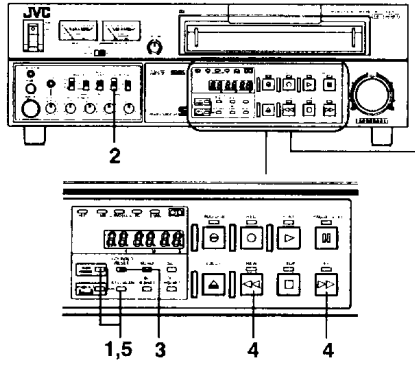
During Slow/Still

The TRACKING control functions for tracking adjustment during step slow motion playback, and for V.LOCK adjustment of a still picture. The TRACKING control has no effect when Menu switch No.337 "SLOW MODE" is set to "LINEAR".

Long Pause function

The Long Pause mode is automatically engaged for tape protection when the Still mode continues for more than 5 minutes.
Long Pause function: The VCR enters the Stop mode. Tape tension is loosened and the drum stops.
To cancel this status: Press any button. The VCR enters the mode corresponding the button pressed.

6-4 COUNTER SEARCH



Operation

1 Engage the Counter Search mode.

AUTO MODE Press the AUTO MODE button to light the Counter Search indicator.

2 Select the counter mode.

COUNTER Set the COUNTER select switch to "CTL".

3 Designate the position you wish to locate later.

COUNTER RESET Press the COUNTER RESET button at the position you wish to locate later.

→ The counter resets to "00:00:00".

4 Start Counter Search.

Press the FF or REW button while in the Stop mode.

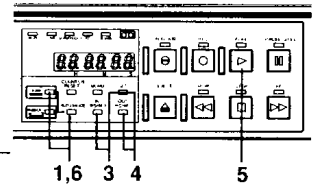
→ Tape will be rewound or fast-forwarded and stop at counter "00:00:00" position.

5 To cancel the Counter Search mode.

AUTO MODE Press the AUTO MODE button. The Counter Search indicator goes off.

When the RM-G800U is connected, counter search and repeat playback are not possible.

6-5 REPEAT PLAYBACK



Operation

1 Engage the Repeat mode.

AUTO MODE Press the AUTO MODE button to light the Repeat mode indicator.

2 Select the counter mode.

COUNTER Set the COUNTER select switch to "CTL" or "TC".

3 Enter the repeat-start point.

IN/+SHIFT Press the SET button while pressing the IN/+SHIFT button where you want Repeat playback to start.

SET → Start point is entered. When no start point is entered, repeat playback will start from the beginning of the tape.

4 Enter the repeat-end point.

OUT/-SHIFT Press the SET button while pressing the OUT/-SHIFT button at the point where you want Repeat playback to end.

SET → End point is entered. When no end point is entered, repeat playback will end at the end of the tape.

5 Start repeat playback.

Press the PLAY button.

→ Repeat playback starts between entered start and end points. Press the STOP button to stop repeat playback.

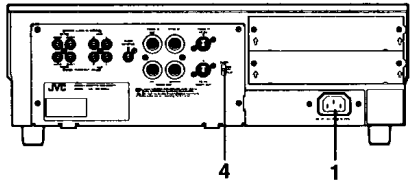
6 To cancel the Repeat mode.

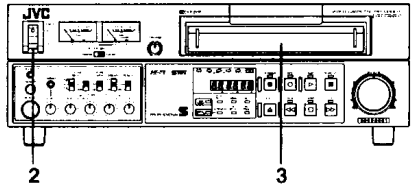
AUTO MODE Press the AUTO MODE button. The Repeat mode indicator turns off.

Repeat playback

The repeat playback start or end point is displayed on the counter for as long as the IN/+SHIFT or OUT/-SHIFT button is pressed. If the COUNTER RESET button is pressed while pressing the IN/+SHIFT or OUT/-SHIFT button, the preset repeat start or end point will be reset.

6-6 EXTERNAL TIMER PLAYBACK





Operation

1 Connect an external timer unit.
Connect it to the AC IN socket. Turn on the external timer.

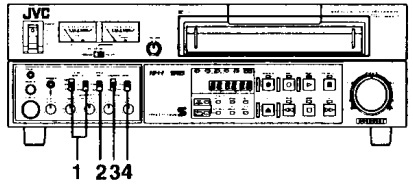
2 Turns the power on.
POWER ON / OFF Set the POWER switch to ON.

3 Load a cassette.
Insert the cassette into the cassette loading slot.

4 Engage the timer playback mode.
TIMER REC OFF PLAY Set the TIMER switch to "PLAY".
→ The VCR will automatically start playback when power is supplied from the external timer at the preset time. (The external timer must have been turned off first.)

7 RECORDING

7-1 PREPARATION



Front panel switch setting

1 AUDIO MONITOR select switches
AUDIO MONITOR AUD MIX AUD -2/R HI-FI NORM Set the AUDIO MONITOR select switches as required. (☞p.11)

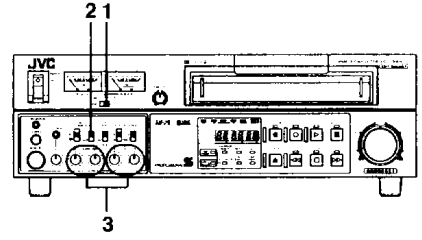
2 VIDEO INPUT select switch
VIDEO INPUT Y/C358 LINE Select the input video signal to be recorded with the VIDEO INPUT switch. (☞p.11)

3 COUNTER select switch
COUNTER CTL TC UB Set the COUNTER switch as required. (☞p.12)

4 REMOTE switch
REMOTE LOCAL REMOTE Set the REMOTE switch as required. (☞p.12)

For BR-S500U users
Section 7 describes recording and editing with the BR-S800U. As the BR-S500U is a player, you can skip these sections and go to section 9, p.48.

7-1 PREPARATION



Menu switch setting

Set the following items as required.

●SERVO

Frame Servo setting:
No.000 "FRAME SERVO" ... p.28
Factory preset: "ON"

Auto H-Phase setting:
No.004 "AUTO H. PHASE" p.30
Factory preset: ON

Reference sync signal setting:
No.003 "SYNC SELECT" p.28
Factory preset: "AUTO"

●VIDEO

VHS recording with S-VHS tapes:
No.100 "S-VHS SELECT" p.28
Factory preset: "AUTO"

The type of picture:
No.101 "EDIT SELECT" ... p.28
Factory preset: "OFF".

●AUDIO

Hi-Fi audio recording:
No.200 "Hi-Fi AUDIO REC" p.29
Factory preset: "ON"

Dolby NR for normal audio:
No.201 "NORM. AUDIO DOLBY NR" p.29
Factory preset: "ON"

Audio limiter for normal audio:
No.202 "AUDIO LIMITER" p.29
Factory preset: "ON"

Mixed audio recording on audio-1 track:
No.205 "AUD-1 REC." p.29
Factory preset: "AUD-1"

Hi-Fi audio recording on normal audio tracks:
No.207 "AUDIO INPUT SELECT" p.30
Factory preset: "SEP"

Audio recording level adjustment

1 Switch the AUD-2/R meter for level indication.
METER SELECT TRACKING AUD-2/R Set the METER SELECT switch to "AUD-2/R".

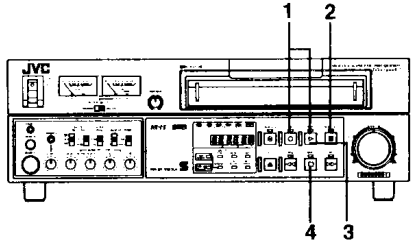
2 Select indication mode.
Set the AUDIO MONITOR switch to "Hi-Fi".
AUDIO MONITOR AUD MIX AUD -2/R HI-FI NORM → Hi-Fi audio level is displayed.
Set the AUDIO MONITOR switch to "NORMAL"
→ Normal audio level is displayed.

3 Adjust the level.
Adjust the audio level with the AUDIO REC LEVEL control corresponding to the signal selected with the AUDIO MONITOR switch.
→ Turn the control until the meters deflect to "0" at peak signal level.

When engaging the Record mode directly from the Play mode, set Menu switch No.003 "SYNC SELECT" to "VIDEO". This can help reduce picture distortion at the record-start point.

☞p.54 GLOSSARY: Frame servo, Auto H-phase, Dolby NR, Audio limiter

7-2 BASIC PROCEDURE



Operation

1 Start recording

Press the PLAY button while pressing the REC button.

→ Both the REC and PLAY indicators light and recording will start.

2 Temporarily stop recording.

Press the PAUSE/STILL button.

→ The PAUSE/STILL indicator lights and recording is paused.

3 Re-start recording.

Press the PLAY button.

→ The PAUSE/STILL indicator turns off and recording is re-started.

Auto Back Space Editing

Auto back space editing function: This function helps prevent picture distortion at edit points in recording.
System: When the PAUSE/STILL button is pressed during recording, the tape rewinds by about 3 seconds and stops in the Record-Pause mode. When recording is re-started by pressing the PLAY button, recording does not take place for about 3 seconds (the input signal is output to the monitor and the operation mode display on the monitor screen blinks for this period.) and re-starts at the position where the PAUSE/STILL button was pressed. The operation mode display on the monitor screen stops blinking.
Setting: Menu switch No.302 "AUTO REC. PREROLL" (☞p.31)
Factory preset: "ON"
When set to "OFF", response time for mode switching (Record—Record-Pause—Record) will be faster, however picture will be distorted at edit points.

4 Stop recording.

Press the STOP button.

→ The REC and PLAY indicators turn off and recording will stop.

CTL time code recording

- CTL time code is automatically recorded on the CTL track whenever recording is executed immediately after the tape has been rewound to the begenning.
- In this case, the time code is recorded from the value "00H 00M 00S" and the user bits are recorded as "00 00".
- If recording is stopped or paused, CTL time code recording will not restart when recording is restarted.

VHS recording with an S-VHS tape

Set Menu switch No.100 "S-VHS SELECT" to "VHS". (☞p.28)

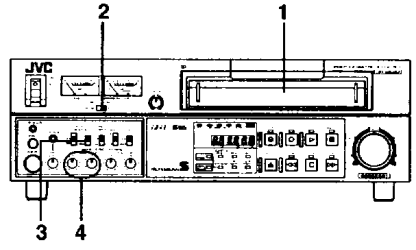
Long Pause function

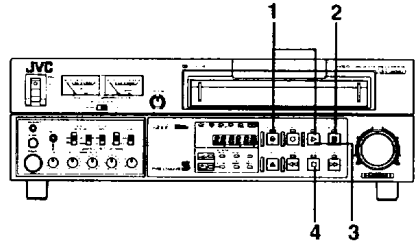
To protect the tape, the Long Pause function is automatically engaged when the Record-Pause mode continues for more than 5 minutes.
Long Pause function: The VCR enters the Stop mode. Tape tension is loosened and the drum stops. The operation mode display on the monitor screen changes to "STBY-OFF".
To cancel this status: Press any button. The VCR enters the mode corresponding to the button pressed.

If PLAY is pressed during recording:

Recording is canceled and playback starts.

7-3 AUDIO DUBBING





Preparation

Menu switch setting

Soundtrack selection: (☞p.29)

Menu switch No.208 "AUD DUB SELECT"
Factory preset: "AUD-2"

Audio dubbing is possible on either the audio-1 track or both audio-1 and audio-2 tracks.

When dubbing on audio-2 track, set Menu switch No.206 "LTC SELECT" to "AUD-2" (factory preset).

1 Load a cassette.

Insert a cassette with safety tab in place into the cassette loading slot.

2 Switch the AUD-2/R meter for level indication.

METER SELECT TRACKING AUD-2/R

Set the METER SELECT switch to "AUD-2/R".

3 Select indication mode for normal audio.

AUDIO MONITOR AUD-1/MIX AUD-2/R HI-FI NORM

Set the AUDIO MONITOR switch to "NORMAL".

4 Adjust the level.

Adjust the audio level with NORMAL AUDIO LEVEL NORM control.

→ Turn the control until the meters deflect to "0" at peak signal level.

Procedure

1 Engage audio dubbing.

Press the PLAY button while pressing the AUD DUB button in the Play or Still mode.

→ Both the AUD DUB and PLAY indicators light and audio dubbing starts.

2 Temporarily stop audio dubbing.

Press the PAUSE/STILL button.

→ The PAUSE/STILL indicator lights and audio dubbing is paused.

3 Re-start audio dubbing.

Press the PLAY button.

→ The PAUSE/STILL indicator turns off and audio dubbing is re-started.

Some noise bars may appear in the still picture or the picture may roll up and down at this time. This increases switching precision and is not a malfunction.

4 Stop audio dubbing.

Press the STOP button.

→ The AUD DUB and PLAY indicators turn off and tape stops.

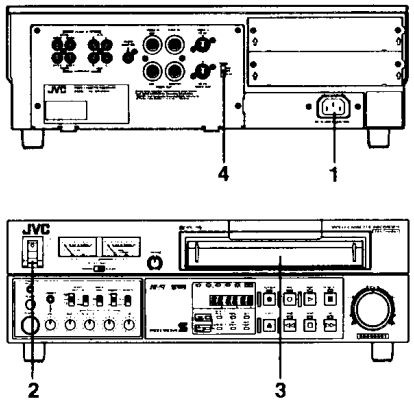
Auto Back Space Editing Function

As with the Record mode, this function is also available in the Audio Dubbing mode.
Setting: Menu switch No.302 "AUTO REC. PREROLL" (☞p.31)
Factory preset: "ON"
When set to "OFF", response time for mode switching (Record—Record-Pause—Record) will be faster, however sound will be distorted at edit points.

If PLAY is pressed during audio dubbing:

Audio dubbing is canceled and playback starts.

7-4 EXTERNAL TIMER RECORDING



Operation

1 Connect an external timer.
Connect it to the AC IN socket. Turn on the external timer.

2 Turn the power on.
POWER ON OFF Set the POWER switch to ON.

3 Load a cassette.
Insert a cassette with safety tab in place into the cassette loading slot.

4 Engages the timer recording mode.
TIMER REC PLAY
- Set the TIMER switch to "REC". (Leave the VCR in the Stop mode. Do not press any other button such as PLAY or REC.)
- Make necessary settings on the external timer.

→ The VCR will automatically start recording when power is supplied from the external timer at the preset time. (The external timer must have been turned off first.)

7-5 REPEAT RECORDING

Operation

1 Engage the Repeat mode.
Set Menu switch No.305 "REPEAT REC." to "ENABLE". (☞p.31)

2 Start repeat recording.
Start recording referring to the procedure described in the "RECORDING — BASIC PROCEDURE". (☞p.40)
→ Repeat recording starts.
→ The VCR will automatically rewind the tape at the tape end start recording again from the beginning of the tape.

8 EDITING WITH RM-G800U (option)

8-1 EDITING CONTROLLER

In combination with an optional editing controller, the BR-S800U can be used in an automatic video/audio editing system. Connectable controllers are listed below.

Editing controller RM-G800U

This controller is designed exclusively for the BR-S800U.
- One player and one recorder can be connected.
- CTL time code setting is possible.
- Can be connected to the BR-S800U without any interface board.

Editing controller RM-G860U

This controller is designed for use with most professional VCRs.
- Two players and one recorder can be connected.
- CTL time code setting is not possible.
- To connect to the BR-S800U, the optional SA-K26U RS-422 interface board or the optional SA-K28UA 45-pin interface board is necessary.

Editing controller RM-G870U

This controller is designed for use with most professional VCRs.
- Can store data for up to 127 edit events.
- Two players and one recorder can be connected.
- CTL time code setting is possible.
- To connect to the BR-S800U, the optional SA-K26U RS-422 interface board is necessary.

Editing controller RM-G810U/RM-G86U

This controller is designed for use with most professional VCRs.
- One player and one recorder can be connected.
- CTL time code setting is not possible.
- To connect to the BR-S800U, the optional SA-K28UA 45-pin interface board is necessary.

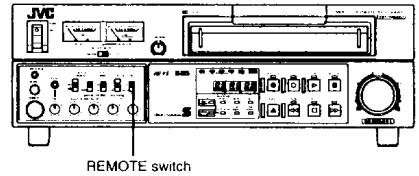
This manual explains editing procedures using the RM-G800U. For procedures using other controllers, refer to the instructions supplied with the controller.

Editing System
To configure an editing system, it is necessary to have a playback VCR (such as the BR-S500U), a recording VCR (such as BR-S800U), and an editing controller.

8-2 PREPARATION

1 Connect necessary components correctly.
(See "CONNECTIONS" ☞p.20)

2 Make necessary settings on connected units.



- For Player VCR (BR-S800U or BR-S500U)
REMOTE LOCAL REMOTE Set the REMOTE switch to REMOTE.
→ See p.34 for other settings.

- For Recorder VCR (BR-S800U)
REMOTE LOCAL REMOTE Set the REMOTE switch to REMOTE.
→ See p.38 for other settings.

- For RM-G800U
Set menu settings as desired while referring to the monitor (connected to the recorder VCR's VIDEO OUT MONITOR connector). Refer to the RM-G800U's instruction manual for details.

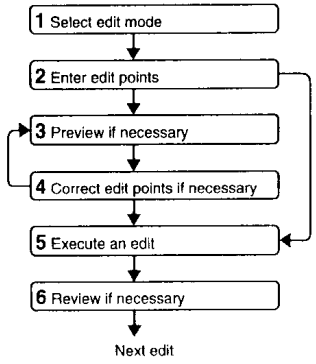
Slow motion mode setting
Menu switch No.337 "SLOW MODE"
Setting: "STEP" or "LINEAR"
Factory preset: "STEP"
The mode setting for slow-motion playback. The factory preset is set to "STEP" for noiseless slow motion. For editing, we recommend that you set the slow-motion mode to "LINEAR" for the following reasons.
1: Though noise appears during slow-motion playback, it is easier to identify the transition point of frames.
2: Normal audio can be output during slow-motion playback. (☞p.32)

☞p.54 GLOSSARY: CTL time code

8-3 PROCEDURE

Operating flowchart

Editing procedures can be summarized as follows:


1 Select edit mode
2 Enter edit points
3 Preview if necessary
4 Correct edit points if necessary
5 Execute an edit
6 Review if necessary
Next edit

1 Select edit mode
Select either assemble editing or insert editing

2 Enter edit points
Enter both edit-in and -out points.

3 Preview if necessary
Perform "rehearsal" editing to confirm that the entered edit-in and -out points are appropriate. This is referred to as "Preview".

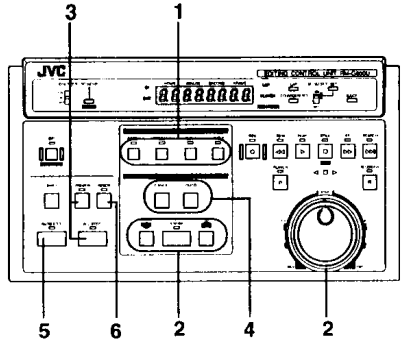
4 Correct edit points if necessary
Entered edit points can be corrected.

5 Execute an edit
After entering edit points, perform editing. This is referred to as "Executing an edit".

6 Review if necessary
After executing an edit, you may want to rewind and check the quality of the transition between edit points. This is referred to as "Review".

Proceed with editing by repeating the procedures above using the RM-G800U.

Procedure



1 Select edit mode.

ASSEM — To perform assemble editing, press ASSEM.

VIDEO/Hi-Fi — To perform insert editing, select the track you're going to replace by pressing either VIDEO/Hi-Fi or AUD-1 or AUD-2.

AUD-1 — VIDEO/Hi-Fi: Prerecorded video and Hi-Fi audio track is replaced by new material.
AUD-1: Prerecorded normal audio-1 track is replaced by new material.

AUD-2 — AUD-2: Prerecorded normal audio-2 track is replaced by new material.

2 Enter edit points.
Set edit-in point for each VCR (Feeder/Recorder) and set edit-out point for either Feeder or Recorder.

PLAYER — Press "P" to set data for Feeder and press "R" to set data for Recorder.

RECORDER — Locate desired edit point using JOG/SHUTTLE controls.

IN ENTRY — To enter edit-in point, press ENTRY while pressing IN.

ENTRY OUT — To enter edit-out point, press ENTRY while pressing OUT.

☞ p.54 GLOSSARY: Assemble editing, Insert editing

8-3 PROCEDURE

3 Preview if necessary.

PREVIEW — Press the PREVIEW button to check transition between edit points before executing an actual editing.
→ The Recorder and Player start to run as they would in actual editing, and then enter the Still mode.

ALL STOP — To quit during preview editing, press the ALL STOP button.

4 Correct edit points if necessary.
Entering a new edit point automatically cancels the previous edit point.

To confirm the picture at the edit point: Press the
GOTO — GOTO button while pressing the IN or OUT button.
→ The VCR accesses the designated edit point and enters the Still mode.

To cancel an edit point without entering a new one:
CANCEL — Press the CANCEL button while pressing the IN or OUT button.

To correct edit points more precisely: Turn the JOG dial while pressing the IN or OUT button.

5 Execute the edit.

AUTO EDIT — Press the AUTO EDIT button.
→ Automatic editing is executed.

6 Review if necessary.

REVIEW — Before you enter new edit points for next edit, press REVIEW.
→ Recorder automatically plays back the last executed.

For details about editing using the RM-G800U, refer to the RM-G800U's instruction manual.

Though a picture may be distorted on the monitor at the edit-in or -out point while in the preview or automatic editing modes, the actual transition is not affected and edited pictures will be normal.

VCR operation during editing

1. Both Feeder and Recorder preroll.
2. Both Feeder and Recorder start playback.
3. Recorder's mode changes to Record at the edit-in point.
4. Ends editing at the edit-out point.
   In assemble editing: Recorder keeps recording after the edit-out point for about 2 seconds.
   In insert editing: Recorder's mode switches to playback and runs for about 2 seconds.
5. Both Feeder and Recorder return to the edit-out point and enter the Still mode. (If RM-G800U Menu item #01 "OUT POINT RETURN" is set to "00".)

To stop editing while editing is in progress:
Press ALL STOP. Editing stops at the point where the button is pressed.

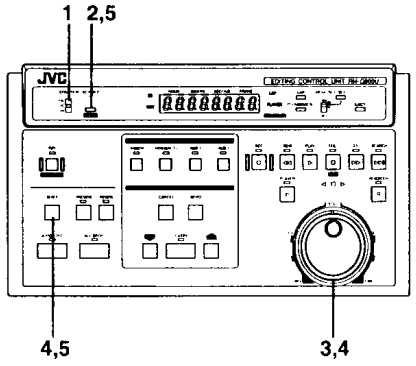
8-4 TIME CODE SETTING

Preparation

■ To use VITC or LTC time codes, you must first install the optional time code generator/reader SA-R50U.

■ Optional boards are not required when using CTL time codes.

■ Put the Recorder in the Stop mode.



Procedure

1 Select time code or user bits to be set.

COUNTER — Set the COUNTER switch of both Recorder and the RM-G800U to either TC or UB as desired.
TC: To set time code.
UB: To set user bits.

2 Set the time code/user bits setting mode.

TC HOLD — Press the TC HOLD button.
→ The leftmost digit on the counter will start blinking.

3 Enter the value for blinking digit.

Turn the JOG dial.
→ The value of the blinking digit changes. Set as desired.

4 Move to another digit.

SHIFT — Press the SHIFT button.
→ Blinking digit moves to right each time the button is pressed.

Repeat steps 3 — 4 until all data is set.

5 Transfer entered data.

SHIFT + TC HOLD — Press the TC HOLD button while pressing the SHIFT button.
→ Entered data is transferred to the Recorder.
→ Counter stops blinking.

Checking of time code data transferred to the recorder

When REC is pressed while the VCR is in the Stop or Still mode, time code preset data will be displayed on the counter display.

CTL time code user bits setting

CTL time code user bits are defined by 4 digits. The last 4 digits ("SECOND" and "FRAME") are used for CTL time code user bits. Although you can set values for "HOUR" and "MINUTE",those values will no longer be effective when transferred.

After transferring the CTL time codes, you can delete recording based on the preset CTL time code data by switching the COUNTER switch to "CTL" then back to "TC".

☞ p.54 GLOSSARY: VITC, LTC, CTL time code, User bits

9 IN CASE OF DIFFICULTY

9-1 WARNING DISPLAY

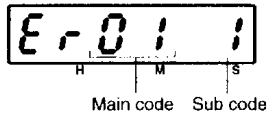
Warning displays

Various warning displays are available to indicate malfunctions. Warnings are shown by numerical codes on the counter and worded messages on the monitor screen.

A warning code consists of a 2-digit main code which indicates the general content of the warning and 1-digit sub code which indicates the specific nature of the problem.

Measure: When the warning display appears, take appropriate action as described below. If the problem persists, consult your local JVC dealer.

Warning display on the counter



Warning display on screen

Warning codes

WARNING CODE: 011
On-screen: LAMP FAILURE

Symptom: Tape-begin/end sensor LED burns out.
Operation: The VCR stops and all controls become inoperative.
Solution: Turn the power off and then turn on again.

WARNING CODE: 021
On-screen: CONDENSATION ON DRUM

Symptom: Moisture condensation on drum.
Operation: 1. The cassette is ejected.
2. Drum starts rotating and cassettes cannot be loaded.
3. After condensation has been eliminated, the display goes off and cassettes can be loaded.
Solution: Wait until the displays turn off. Do not turn off the power.

WARNING CODE: 081
On-screen: SUP TENSION FAILURE

Symptom: Abnormal tape tension.
Operation: The VCR stops and all controls become inoperative.
Solution: Turn the power off and then turn on again.

WARNING CODE: 321
On-screen: FAILURE IN LOADING

Symptom: Tape cannot load correctly.
Operation: Tape unloads and the cassette is ejected.
Solution: Insert the cassette again or try another cassette.

WARNING CODE: 331
On-screen: FAILURE IN UNLOADING

Symptom: Tape cannot unload.
Operation: The VCR stops and all controls become inoperative.
Solution: Turn the power off and then turn on again.

9-1 WARNING DISPLAY

Warning codes

WARNING CODE: 411
On-screen: CASSETTE EJECT FAILURE

Symptom: Cassette carriage does not lift.
Operation: The VCR stops and all controls become inoperative.
Solution: Turn the power off and then turn on again.

WARNING CODE: 561 — 567
On-screen: TAPE DEFECTIVE

Symptom: Tape is broken.
Operation: The cassette is ejected.
Solution: If there is nothing wrong with the cassette, insert it again. Otherwise, insert another cassette.

WARNING CODE: 571 — 572
On-screen: END LEADER DETECTION

Symptom: Tape-end sensor works abnormally.
Operation: 1. Rewind mode is engaged.
2. If the leader tape is detected within 3 seconds, the cassette is ejected.
Solution: Insert the cassette again.

WARNING CODE: 581 — 582
On-screen: BEGIN LEADER DETECTION

Symptom: Tape-beginning sensor works abnormally.
Operation: 1. FF mode is engaged.
2. If the leader tape is detected within 3 seconds, the cassette is ejected.
Solution: Insert the cassette again.

WARNING CODE: 701
On-screen: DRUM MOTOR FAILURE

Symptom: Abnormal drum servo.
Operation: The VCR stops and all controls become inoperative.
Solution: Turn the power off and then turn on again.

WARNING CODE: 711
On-screen: CAPSTAN MOTOR FAILURE

Symptom: Abnormal capstan servo
Operation: The VCR stops and all controls become inoperative.
Solution: Turn the power off and then turn on again.

WARNING CODE: 721 — 726
On-screen: SUP REEL MOTOR FAILURE

Symptom: Supply reel rotates abnormally.
Operation: The VCR stops and all controls become inoperative.
Solution: Turn the power off and then turn on again.

WARNING CODE: 731 — 735
On-screen: TU REEL MOTOR FAILURE

Symptom: Take-up reel rotates abnormally.
Operation: The VCR stops and all controls become inoperative.
Solution: Turn the power off and then turn on again.

When Menu switch No.343 "SUB WARNING INHIBIT" is set to "ON", the following warning codes are not available for display.

Warning code 321	"FAILURE IN LOADING"
Warning code 561 – 567	"TAPE DEFECTIVE"
Warning code 571 – 572	"END LEADER DETECTION"
Warning code 581 – 582	"BEGIN LEADER DETECTION"

9-2 TROUBLESHOOTING OTHER PROBLEMS

VIDEO PROBLEMS

Symptom: Playback picture is unstable.
Cause: Reference sync signal is set to VIDEO and the input video signal is unstable or noisy.
Solution: Take either of the following measures.
1. Set Menu switch No.003 "SYNC SELECT" to "INTERNAL". (☞p.28)
2. Set Menu switch No.003 "SYNC SELECT" to "EXTERNAL" and input an external sync signal. (☞p.28)
3. Disconnect the input video signal.

Symptom: Playback picture is blurred or interrupted.
Cause: Tracking in not adjusted correctly.
Solution: Adjust the tracking.

Cause: Video heads may be dirty.
Solution: Head cleaning is necessary. Consult your local JVC dealer.

Symptom: Picture is distorted at the switching point of recording.
Cause: Random-interlaced video signal or low S/N video signal (after repeated dubbing) has been recorded.
Solution: Set Menu switch No.000 "FRAME SERVO" to "OFF". (☞p.28)

Cause: Auto H-Phase is set to OFF.
Solution: Set Menu switch No.004 "AUTO H. PHASE" to "ON" (☞p.30)

Symptom: S-VHS recording is not possible.
Casue: A VHS tape is being used.
Solution: Use an S-VHS tape.

Cause: Menu switch No.100 "S-VHS SELECT" is set to "VHS".
Solution: Set it to "AUTO". (☞p.28)

Symptom: On-screen display is not available.
Cause: Monitor is not connected to the VIDEO OUT MONITOR connector.
Solution: Connect to VIDEO OUT MONITOR.

Cause: Menu switch No.500 "ON SCREEN DISPLAY" is set to "OFF".
Solution: Set it to "ON". (☞p.29)

Reference pages
Menu switch setting p.25

9-2 TROUBLESHOOTING OTHER PROBLEMS

AUDIO PROBLEMS

Symptom: No audio is output during playback.
Cause: Soundtrack selection is not correct.
Solution: Set the AUDIO MONITOR switch to check on which track the audio signal is recorded. (☞p.11)

Cause: Menu switch No.206 "AUD-2/LTC" is set to "LTC", and normal audio is not output from the AUD-2 track.
Solution: Set the switch to "AUD-2".

Symptom: Breaks in Hi-Fi audio during playback.
Cause: Tracking is not adjusted correctly.
Solution: Adjust the tracking. (☞p.35)

Symptom: HI-FI audio is not output during playback.
Cause: Menu switch No.203 "AUDIO OUT SELECT" is set to "NORM".
Solution: Set it to "SEP". (☞p.30)

Symptom: HI-FI audio is not output during search.
Cause: This is normal, not a malfunction.
Solution: To output normal audio from AUDIO OUT Hi-Fi during search, set Menu switch No.204 "Hi-Fi OUT AT SEARCH" to "NORM". (☞p.30)

Symptom: Normal audio is not output during search.
Cause: Menu switch No.337 "SLOW MODE" is set to "STEP".
Solution: Set it to "LINEAR". (☞p.32)

RECORDING PROBLEMS

Symptom: Recording is not possible.
Cause: Cassette's safety tab has been removed.
Solution: Reseal the slot with adhesive tape. (☞p.5)

Cause: Menu switch No.304 "RECORDING INHIBIT" is set to "ON".
Solution: Set it to "OFF". (☞p.31)

Reference pages
Menu switch setting p.25

9 IN CASE OF DIFFICULTY

9-2 TROUBLESHOOTING OTHER PROBLEMS

OPERATION PROBLEMS

Symptom: Control buttons are inoperative.
Cause: The REMOTE switch is set to REMOTE.
Solution: Set it to LOCAL. (☞p.12)

Cause: Menu switch No.002 "OPERATION LOCK" is set to "ON".
Solution: Set it to "OFF". (☞p.28)

COUNTER DISPLAY PROBLEMS

Symptom: Time counter does not run.
Cause: Time counting is based on the recorded CTL signals. The counter does not function with non-recorded segments.

Cause: The Menu switch setting mode is engaged.
Action: Press the MENU button to engage the time counter mode. (☞p.9)

Cause: The time counter of an optional optional remote control connected via 45-pin remote will not run at search speeds higher that X17
Action: Set Menu switches No.319 "TAPE MAX SPEED" and No.340 "SEARCH SPEED" to "X17". (☞p.32)

REPEAT PLAYBACK PROBLEMS

Symptom: Repeat start and end point cannot be set.
Cause: A different counter mode has been used to set the start and end points.
Action: Use the same counter mode (CTL or TC) for both points. (☞p.37)

Symptom: Repeat playback is not possible.
Cause: A different counter mode has been used for start/end point entry than that used for playback.
Action: Use the same counter mode for both. (☞p.37)

EDIT TIMING PROBLEMS

Symptom: There is a discrepancy between the recorder's edit point and the edit controller's.
Cause: Recorder/edit controller edit timing has not been correctly adjusted.
Solution: Refer to p.21 and set the edit timing correctly.

Reference pages
Menu switch setting p.25

10 OPTIONAL ACCESSORIES

Rack mount adapter SA-K65U

Required when installing the BR-S800U/BR-S500U in a 19" EIA-standard rack.

Rails and brackets

For rack installation, slide rails and brackets are required in addition to the SA-K65U. We recommend the following parts.
Accuride C-305-20 (Slide rail)
BK5355 (Bracket)

Installation

1 Attach the SA-K65U rack mount adapter to the VCR with six M4 screws.

2 Attach the inner members of the slide rails to the VCR with the six M4 screws.

3 Attach the outer members of the slide rails to the rack with the front and rear brackets.

4 Pull out the outer members of the slide rails until they stop.

5 Fix the inner members of the slide rails attached to the VCR into the rails of outer members, and insert the VCR into the rack. Insertion may be obstructed where the springs are located. Press both sides' springs and insert the VCR fully to the end.

ATTENTION:
Do not use screws more than 8 mm long, otherwise you may damage the VCR's internal circuitry.

The rack mount adapter handle is only for sliding the unit. Do not carry the unit by the handle.

Special instructions for installation of slide rails may be necessary depending the rack used. For details, consult authorized personnel at the shop where you purchased the equipment.

45-pin interface board SA-K28UA

This interface board permits control of this unit via 45-pin remote.
With this board installed in the rear panel expansion slot, the following remote controls can be used.
RM-86U
RM-G810U
RM-G860U
RM-G80U

When using RM-86U:
Set Menu switches No.330 "VIDEO EDIT DELAY" and No.331 "AUDIO EDIT DELAY" to "4 FRAMES". (☞p.32)
Set Menu switches No.319 "TAPE MAX SPEED" and No.340 "SEARCH SPEED" to "X17". (☞p.31 and p.32)

NOTES:
- SA-K28U cannot be used. Use SA-K28UA.
- When editing with a 45-pin remote via this board, be sure that the settings for Menu switch No.337 "SLOW MODE" are the same for both the player and recorder.

RS-232C interface board SA-K27UA

This interface board permits control of the unit via RS-232C remote.
An RS-232C cable is also necessary. The SA-K27UA's RS-232C connector type is D-sub 9-pin. Use "reverse-type (cross-type)" RS-232C cable.

NOTE:
SA-K27U cannot be used. Use SA-K27UA.

Digital noise reduction board SA-N50U

This board minimizes the video signal noise generated by repeated dubbing. In addition, it stabilizes video signal time base errors (jitters).

Time code generator/reader board SA-R50U

SMPTE time code (LTC, VITC, user bits) recording and playback are possible with this board installed.
To install the SA-R50U, an adapter board SA-K50U is necessary.
To install the SA-R50U on the SA-K26U RS-422 board, no adapter board is necessary.

RS-422 interface board SA-K26U

This interface board permits control of the unit via RS-422 remote.
With the SA-R50U installed in this board, LTC/VITC editing is possible via RS-422 9-pin remote.

Wired remote control RM-G30U

Controls all basic VCR operations. Cable length is 2 m.

Y/C cables

A variety of Y/C cables are available.

	Connected units' connector type		
Model	Output	Input	Length
VC-G30U	4-pin	4-pin	3 m
VC-G50U	4-pin	4-pin	5 m
VC-G3030U	4-pin	7-pin	3 m
VC-G2030U	7-pin	4-pin	3 m
VC-G2050U	7-pin	4-pin	5 m

Extension remote cable VC-G8030U

Extension cable for RM-G800U. Cable length is 3 m.

For details regarding installation or removal of optional boards, consult your local JVC dealer.

11-1 GLOSSARY

Advanced sync
Advanced sync is a sync signal supplied by the TBC which compensates for the playback signal's time lag against the reference sync signal. A signal is advanced to the reference sync signal level and then input to the TBC. By locking the playback signal to this advanced sync signal, a stable video signal synchronized with the reference sync signal can be output.

Assemble editing
The most basic editing technique, assemble editing replaces the CTL signal, video signal, and audio signal simultaneously. If material is already recorded on the tape, it is erased using the full-erase heads and there may be some picture distortion for several seconds after the last edit-out point.

Audio limiter
A circuit (or a device) which automatically regulates audio signal intensity to maintain a certain level. This can prevent sound distortion due to over-level recording but is not effective with extremely high level signals where distortion may be caused at the amplifier stage.

Auto H-Phase
This circuit minimizes phase differences in the video signal which may occur at edit transitions by matching the horizontal phase of the reference sync signal (external or input video) with that of the playback video signal.

CTL
This is an abbreviation for the "control" signal recorded on the tape to control the video signal and track tape running time. In the VHS format, one control pulse is recorded per frame on the provided control track during recording.

CTL time code
CTL time code is a kind of time code signal based on the control signal. "0" and "1" data is generated by modulating the pulse width of the CTL signal. About 60 of these binary pulses are required to denote absolute position or user bits on the tape. The CTL time code standard makes provisions for both non-drop frame mode and drop frame mode. However, with the BR-S800U/BR-S500U, only non-drop frame mode is available.

Dolby NR
This stands for "Dolby Noise Reduction". This is a noise reduction circuit for audio signals manufactured under license from Dolby Laboratories Licensing Corporation. Optimum noise reduction effect can be obtained when a tape recorded with Dolby NR is played back with Dolby NR.

E-E picture
This stands for "electric-to-electric". The video signal input to the VCR goes through the internal electric circuit and is output to the monitor screen. This picture is referred as the "E-E picture".

Frame servo
In the NTSC system, video images are produced at the rate of 30 frames per second with each frame consisting of 2 fields (odd and even). The frame servo is a mechanism which automatically synchronizes the odd and even fields on the recording tape with those on the source tape. This is necessary in editing to ensure that there is no instability at edit-in and -out points.

Hour meter
A display showing total VCR operating time. Regular maintenance should be scheduled according the number of hours shown on the hour meter.

11 APPENDIX

11-1 GLOSSARY

Insert editing
The most commonly used professional editing technique, insert editing replaces the pre-recorded video signal, audio signal, or both, with new material. Insert editing is based on existing CTL signals.

LTC
Acronym for "longitudinal time code". This is a time code recorded on the tape in the longitudinal direction. Normally, with professional VCRs, the normal audio-2 track is used for LTC signal recording.

TBC
Acronym for "time base corrector". Used to correct time base errors in the playback picture.

Time code
This is a signal which denotes the absolute position on the tape synchronized with the video frame. SMPTE/EBU time code is the standard time code in the video/audio industry.

User bits
This is a portion of the time code signal allocated to the user. In SMPTE time code, an 8-digit hexadecimal number, each digit of which can have values from "0" to "F" is available for user bits while 4-digit is available in CTL time code.

VITC
Acronym for "vertical interval time code". This is a time code which is inserted in the vertical blanking interval.

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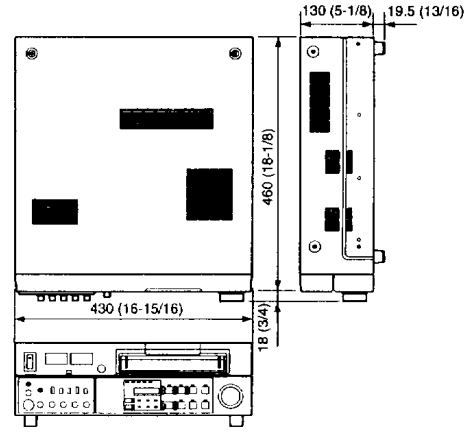
12 SPECIFICATIONS

● GENERAL	BR-S800U	BR-S500U
Format	VHS/S-VHS standard	←
Signal system	NTSC color signal	←
Recording & Playback mode	Recording:SP, Playback: SP/EP	Playback: SP/EP
Tape speed	33.35 mm/s	←
Recording & Playback time	Recording: 120 min. /Playback: 360 min.(EP)	Playback: 360 min.(EP)
Fast forward/Rewind time	Less than 2.5 min. for 120 min. tape	←
Power requirement	120 V AC, 50/60 Hz	←
Power consumption	49 W (58 W when using RM-G800U)	40 W (49 W When using RM-G800U)
Dimensions	430 (W) X 149.5 (H) X460 (D) mm	←
	(16-15/16" X 5-15/16" X 18-1/8")	←
Weight	Approx. 11.5 kg (25.4 lbs)	←
Operating temperature	5°C to 40°C (41°F to 104°F)	←
Storage temperature	–20°C to 60°C (–4°F to 140°F)	←
Humidity	30 % to 80 %	←
● VIDEO		
Composite IN	0.5 to 2.0 Vp-p, 75 ohms, unbalanced	(Not provided)
Y/C IN	Y:1.0 Vp-p, 75 ohms, unbalanced	(Not provided)
	C:0.286 Vp-p, 75 ohms, unbalanced (Burst)	
Composite OUT	1.0 Vp-p, 75 ohms, unbalanced	←
Y/C OUT	Y:1.0 Vp-p, 75 ohms, unbalanced	←
	C:0.286 Vp-p, 75 ohms, unbalanced (Burst)	←
External sync IN	0.5 to 4.0 Vp-p, 75 ohms, unbalanced	←
Horizontal resolution	More than 400 lines (S-VHS)/240 lines (VHS)	←
Signal-to-noise ratio	46 dB (S-VHS)/45 dB (VHS)	←
● AUDIO		
Number of tracks	4 (Hi-Fi X 2, Normal X 2)	←
Line IN	–6 dBs, 10 k-ohms, unbalanced	(Not provided)
Mic IN	–67 dBs, 3 k-ohms, unbalanced	(Not provided)
Line OUT	–6 dBs, 1 k-ohm, unbalanced	←
Phones OUT	– ∞ to –20 dBs, 8 ohms, unbalanced, stereo	←
Hi-Fi audio		
Frequency response	20 to 20,000 Hz	←
Dynamic range	More than 85 dB	←
Wow & flutter	Less than 0.006% WRMS	←
Normal audio		
Frequency response	50 to 10,000 Hz	←
Signal-to-noise ratio	More than 40 dB (NR-off, at 3 % distortion)	←
Wow & flutter	Less than 0.20% WRMS (Normal)	←
● ACCESSORY	Power Cord	←

Specifications shown are in SP mode unless otherwise specified.
Design and specifications subject to change without notice.

DIMENSIONS
Unit: mm (inches)



JVC

BR-S800U
BR-S500U

CTL TIME CODE GUIDE BOOK

This booklet discusses the principles of CTL time code and explains how to use it. In addition to reading your instruction manual, please study the information provided in this booklet carefully.

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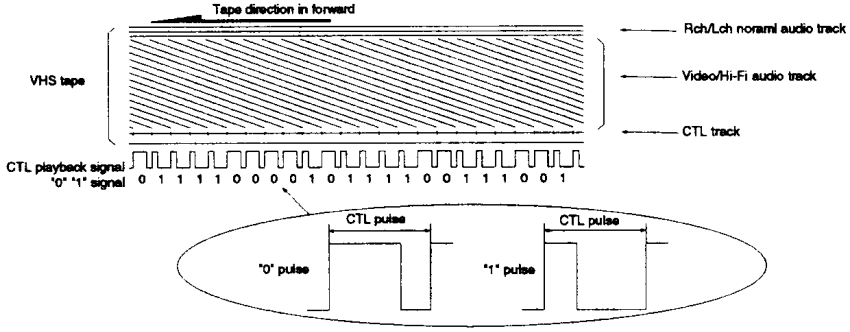
What Is CTL Time Code? 2
CTL Time Code Recording 3
Assemble Editing/Time Code Insertion ... 4
CTL Time Code Setting 5
CTL Time Code Playback 5
On-Screen Display 6
Menu Switches 6
Special Notes 7

What Is CTL Time Code?

CTL time code is based on CTL signals. By modulating the duty proportion of CTL signals, "0" and "1" signals (bits) are generated. These signals are used to denote time data and user bits data. One item of data is made up of one 2-second CTL signal containing 60 bits. Time data is indicated by 6-digit time information (hours, minutes, seconds) and user bits data is indicated by 4-digit hexadecimal values(0-9,A-F). Each item of CTL time code data is generated every 2 seconds. Frame addresses in between are interpolated with the CTL pulse. This makes it possible to denote the time code with frame-units accuracy. Thus, frame-accurate editing and cue-up are possible using the CTL time code system.


Tape direction in forward
VHS tape
Rch/Lch normal audio track
Video/Hi-Fi audio track
CTL track
CTL playback signal
"0" "1" signal
0 1 1 1 1 0 0 0 0 1 0 1 1 1 1 1 0 0 1 1 1 0 0 1
CTL pulse
CTL pulse
"0" pulse
"1" pulse

CTL Time Code Recording

- While CTL time code recording is in progress, the interpolation mark "✻" on the monitor screen turns off.
- When recording is attempted in the Regen mode with a drop-frame-recorded tape, the drop-frame mode is automatically engaged for recording.

To record with the time code data "00:00:00:00" from the beginning of a tape.

- This can be done with either the BR-S800U or RM-G800U.

(1) Set the BR-S800U's REMOTE switch.
- When controlling operations with the BR-S800U: Set to "LOCAL".
- When controlling operations with the RM-G800U: Set to "REMOTE".

(2) Set the COUNTER switch to "TC" or "UB".

(3) Rewind the tape to the beginning.

(4) Press the PLAY button while pressing the REC button to start recording.
→ Time code data is recorded from the value "00:00:00:00".
→ User bits data is recorded as "0000".

NOTE:
- Do not engage the Record mode until tape-begin has been detected. CTL time code recording is not possible from any point part way through the tape.
- If the Record-Pause or Stop mode is engaged during recording, CTL time code and user bits data will no longer be recorded.

To record time code that follows after existing CTL time code data on the tape.

- This can be done with either the BR-S800U or RM-G800U.

(1) Select the BR-S800U's REMOTE switch as desired.

(2) Set the COUNTER switch to "TC" and start playback.
- Make sure that the interpolation mark "✻" turns off on the monitor screen during playback.

(3) Engage the Record mode directly from the Play mode by pressing the REC and PLAY buttons together.
→ Time code data is recorded following from the existing data.
→ User bits data remains the same.

Assemble Editing/Time Code Insertion

CTL time code assemble editing or time code insert must be done with the RM-G800U.

- Set the BR-S800U's REMOTE switch to "REMOTE".
- Set the RM-G800U's Menu switch No.00 "PREROLL TIME" to "5 SECONDS" or longer.
- When editing from the beginning of the tape, first run the tape for a period longer than the preroll time before executing the edit.

To edit with time codes that follow the existing CTL time code data.

("Regen" mode)

(1) Set the COUNTER switch to "TC" and start playback. Check that the interpolation mark "*" turns off on the monitor screen.

(2) Execute assemble editing or time code insert.
- For editing procedures, refer to the RM-G800U's instruction manual, sections 6-2 and 6-4.

→ Time code data is recorded following after the existing time code data.
→ User bits data remains the same.

CTL time code insertion
- To set the CTL time code insert mode, press the AUD-2 button while pressing the SHIFT button.
- To start insertion, press the AUTO EDIT button. Press the ALL STOP button to stop insertion.

To record with preset time code data.

(1) Preset the time code data.
- For setting procedures, refer to the BR-S800U/S500U's instruction manual, page 46, or refer to the RM-G800U's instruction manual, page 21.

(2) Execute assemble editing or the time code insert.
→ Time code data is recorded starting with the preset value.
→ User bits data is recorded as preset.

NOTE:
When only time code data has been preset, the user bits data is determined as the value in the Regen mode for recording (or vice versa).

Time Code Setting

Time code setting must be done with the RM-G800U.

Preset

- For independent presetting of time code or user bits, set the COUNTER switch to "TC" or "UB".

(1) Press the TC HOLD button to engage the preset mode.

(2) Set the desired value using the Jog control and the SHIFT button.

(3) Press the SHIFT and TC HOLD buttons together to set the data.

Checking the preset data

- Press the REC button while the VCR is in the Stop or Still mode, or when no cassette is inserted. → Preset data will be displayed on the counter.

Cancellation of preset mode

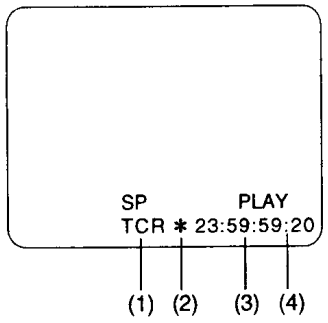
The preset mode can be canceled and the preset data can be deleted by doing either of the following:
- Set the COUNTER switch to "CTL".
- Engage the Record, Assemble edit, or Insert mode.

CTL Time Code Playback

CTL time code can be played back with either the BR-S800U/BR-S500U or the RM-G800U.

- Set the COUNTER switch to "TC" or "UB" and start playback.
  TC: Time code playback.
  UB: User bits playback.
- Possible playback speed: X1 to X11 for both forward and reverse search.
- Interpolation mode
  If there is an error in the CTL time code readout during playback, time code is interpolated with the control signals. In this case, the interpolation mark "*" is displayed on the monitor screen.
  The interpolation mark "*" is not displayed in the following cases.
  - When time data is being read every 2 seconds and frames in between are interpolated with CTL signals.
  - When a loss of data is only one item (2 seconds) during continuous time codes.

On-Screen Display



(1) CTL time code counter mode
Displayed in recording or playback.
TCR: CTL time code reader data
UBR: CTL time code user bits reader data

Displayed only when checking preset data.
TCG: CTL time code generator data
UBG: CTL time code user bits generator data

(2) Interpolation mark
During playback → "*" is displayed in the interpolation mode.
During recording → No display during time code recording.

(3) Counter display
Time data: 24-hour mode, 8-digit display (Hours, Minutes, Seconds, Frames)
User bits data: 4-digit display with hexa-decimal numbers. It is only possible to set the last 4 digits of the 8 digits user bits.

(4) Drop frame indication
" . " is displayed in the Drop frame mode and " : " is displayed in the Non-drop frame mode for both recording and playback.

Menu Switches

When the optional VITC/LTC generator/reader SA-R50 is installed, set the Menu switch No.418 of the BR-S800U/BR-S500U to select the type of time code either VITC/LTC or CTL TC.

Menu switch No.418 "VITC/LTC, CTL TC
CTL TC (1) — Selects CTL TC.
●VITC/LTC (0) — Selects VITC/LTC.
●: Factory preset

Special Notes

(1) CTL time code Recording/Playback is not possible in less than 6 seconds.
Because each CTL time code data item is formed in 2 seconds, it is necessary to run the tape for more than 6 seconds to readout the data. When playing back a tape for less than 6 seconds, or a when playing a tape on which CTL time code has been recorded for less than 6 seconds, correct data readout is not possible.

(2) Do not record CTL time code on an EP-recorded tape.
It is not possible to set the counter mode for CTL time code if an EP-recorded tape is used.

(3) Bit loss at the edit points
When assemble editing/time code insertion has been executed, information in the vicinity of the 8th bit will be lost. However, time information between edits is not interrupted.

(4) A tape with discontinuous time codes may not edit or cue up correctly.
If there is any discontinuity in recorded time codes, a malfunction may occur in editing or cue-up. When a tape contains such time codes, insert continuous time codes before using it.

(5) Preroll time must not be less than 5 seconds.
When preroll time is set to less than 5 seconds in the Regen mode, editing may be executed before reading of the recorded time codes has been completed. In this case, the Regen mode won't work correctly.

(6) Editing from the beginning of a tape
When editing from the beginning of a tape, be sure to run the tape for long enough to allow the time code to be read correctly.

(7) Drop frame indication at edit point
Even with a tape recorded in the non-drop frame mode, the drop frame indication may sometimes be displayed for 2 seconds at the edit switching point.

(8) Drop frame mode availability
The drop frame mode is available only for reading and writing in the Regen mode. Preset data writing in the drop frame mode is not possible.

(9) User bits data that should not be used.

If any of the following combinations of characters are used for user bits, errors may occur in data reading.

0FF8, 0FF9, 0FFA, 0FFB
1FF0, 1FF1, 1FF2, 1FF3, 1FF4, 1FF5, 1FF6, 1FF7
2FF8, 2FF9, 2FFA, 2FFB
3FE*
4FF8, 4FF9, 4FFA, 4FFB
5FF0, 5FF1, 5FF2, 5FF3, 5FF4, 5FF5, 5FF6, 5FF7
6FF8, 6FF9, 6FFA, 6FFB
7FC*, 7FD*
8FF8, 8FF9, 8FFA, 8FFB
9FF0, 9FF1, 9FF2, 9FF3, 9FF4, 9FF5, 9FF6, 9FF7
AFF8, AFF9, AFFA, AFFB
BFE*
CFF8, CFF9, CFFA, CFFB
DFF0, DFF1, DFF2, DFF3, DFF4, DFF5, DFF6, DFF7
EFF8, EFF9, EFFA, EFFB
*3FE, *7FC, *7FD, *BFE

192 variations in total. *: Any value of hexadecimal numbers.

(10) CTL time code may not be recorded correctly in the assemble editing/time code insertion modes if edit duration has been set to less than 6 seconds. In this case, after all edit procedures have completed, execute the CTL time code insertion again from the beginning.

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SECTION 1
GENERAL DESCRIPTION AND DISASSEMBLY

1. 1 INTERNAL SWITCHES

▪ [1] [0] VIDEO-1 board

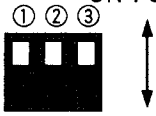
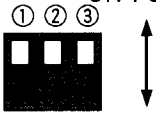
Symbol No.	Switch Name	Setting at Shipment	Function
SW 1 : 15D	Adjusting switch	NOR ■ ADJ ⟷	NOR : Normal operation ADJ : Logical COMB adjustment mode Set to "NOR" for general use.

▪ [0] [3] SLOT MOTHER board

Symbol No.	Switch Name	Setting at Shipment	Function
SW 1-1	Output selector switch	ON : SHORT ① ② ③ OFF : OPEN	To select one of output (or input) signals originating from the internal circuits of this set and from an optional board connected to the upper slot. For detail of switch setting, refer to the service manual of the externally connected optional board. **ON :Output (or input) signal of internal circuit is selected.** **OFF :Output (or input) signal via optional equipment is selected.** For the function of respective switches, refer to the following table.
SW 1-2	Input selector switch	ON : SHORT ① ② ③ OFF : OPEN	

SW1-1-①	To select C signal output of S-OUT terminal.
SW1-1-②	To select Y signal output of S-OUT terminal.
SW1-1-③	To select output of LINE OUT-1 terminal.
SW1-2-①	To select C signal input.
SW1-2-②	Not used.
SW1-2-③	To select Y signal input.

Note : If all of the above switches are set to OFF without connection of optional board, no signal is output.

Symbol No.	Switch Name	Setting at Shipment	Function
SW 2-1	Output selector switch	ON : SHORT ① ② ③  OFF : OPEN	To select one of output (or input) signals originating from the internal circuits of this set and from an optional board connected to the lower slot. For detail of switch setting, refer to the service manual of the externally connected optional board. **ON :Output (or input) signal of internal circuit is selected.** **OFF :Output (or input) signal via optional equipment is selected.** For the function of respective switches, refer to the following table.
SW 2-2	Input selector switch	ON : SHORT ① ② ③  OFF : OPEN	

SW2-1-①	To select C signal output of S-OUT terminal.
SW2-1-②	To select Y signal output of S-OUT terminal.
SW2-1-③	To select output of LINE OUT-1 terminal.
SW2-2-①	To select C signal input.
SW2-2-②	Not used.
SW2-2-③	To select Y signal input.

Note : If all of the above switches are set to OFF without connection of optional board, no signal is output.

SW 3	TBS switch	ON ■ OFF ⟷	To select external sync signal input to the set. **OFF :Input signal to the SYNC IN terminal is selected.** **ON :Signal that passed the optional TBS board (SA-N50) is selected. (When TBS board is connected, set this switch to ON.)** ***Note: "ON" and "OFF" appearing on the board differ from the ON and OFF operations of this switch shown on the circuit diagram.***

1. 2 REMOVAL OF EXTERNAL COVERS

Note: When disassembling the set, make sure that the power is disconnected (power cord is disconnected from the AC outlet) beforehand.

Cover to remove	Screw to remove	Description
Top cover (Fig.1-2-1)	Ⓐ(2pcs.) total (2pcs.)	• Remove two screws Ⓐ and pull the top cover rearward to remove it.
Bottom cover (Fig.1-2-4)	Ⓑ(3pcs.), Ⓒ(1pcs.) total (4pcs.)	• Remove screws Ⓑ and Ⓒ (four screws in total). ***Note :Among the four screws, one screw Ⓒ is different from others.*** • Release the bottom cover from two hooks Ⓕ of the rear bracket and pull it out.
Front panel (Fig.1-2-1,3,4)	Ⓐ(2pcs.) total (2pcs.)	• Remove the top cover. (Refer to the above description.) • Remove all the knobs of the SEARCH control, TRACKING control (with washer), and various LEVEL controls. • Carefully lift the front panel assembly upwards to disengage the three hooks Ⓖ retaining it in the upper side. (Fig. 1-2-3) • Tilt the front panel assembly frontward to disengage the three hooks Ⓗ retaining it in the lower side, and then take out the front panel assembly. (Fig. 1-2-4). ***Note :For removing and reinstalling the cassette housing, make sure to remove the front panel beforehand otherwise the REC SAFETY switch may be damaged.***
Rear bracket (Fig.1-2-5)	Ⓓ(4pcs.) total (4pcs.)	• Remove four screws Ⓓ with the arrow, and pull out the rear cover. ***Note :*** ***• Draw out the rear bracket most carefully, because the REAR board is fixed to it and this board is furthemore connected with the MOTHER-2 board on the chassis by the connector.*** ***• When reinstalling the rear bracket, it is recommended to take off the top cover to be able to see the connector.***
Right (Left) side cover (Fig.1-2-1,2)	Ⓔ(4pcs. each) total (4pcs.)	• Remove four screws Ⓔ from a side (right or left) and pull out a side cover. ***Note :When screwing the right (left) side cover again, pay careful attention to the screw holes near the front panel so as to screw down two screws into the proper screw holes. (See Fig. 1-2-2)***

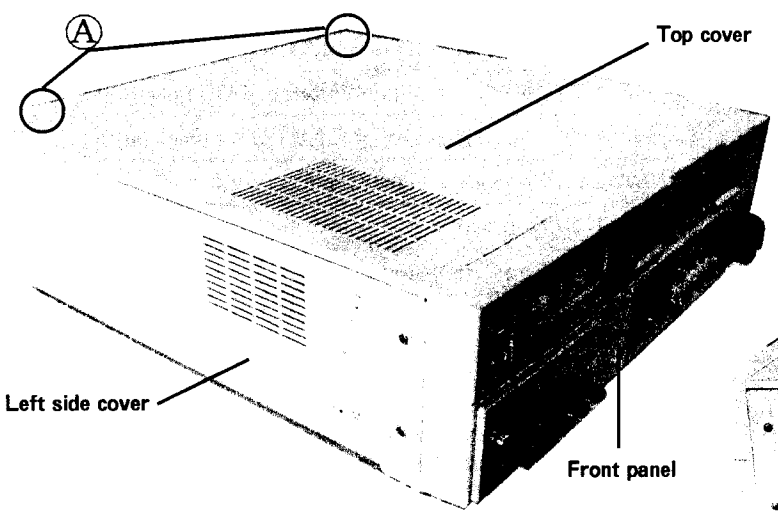


Fig.1-2-1

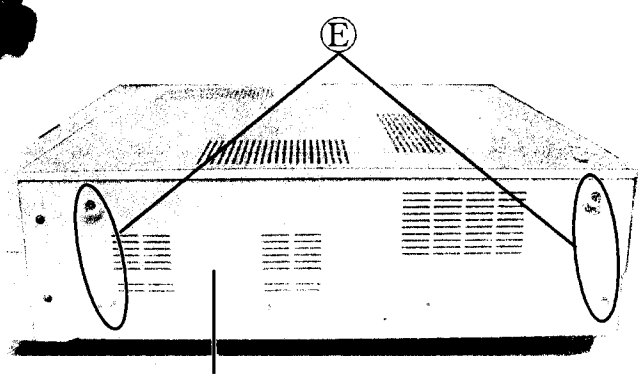


Fig.1-2-2

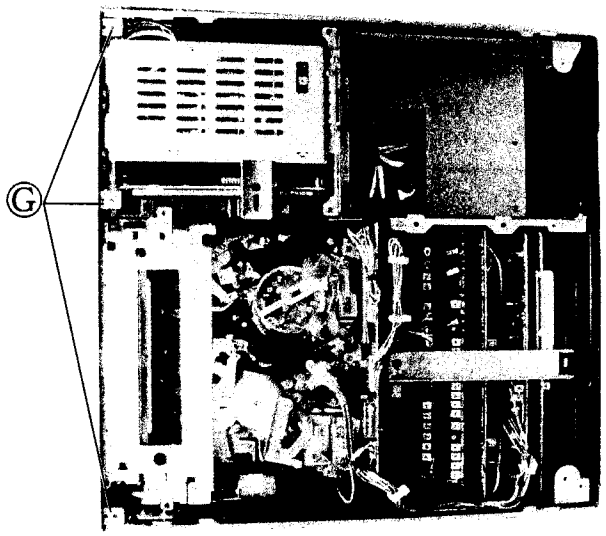


Fig.1-2-3

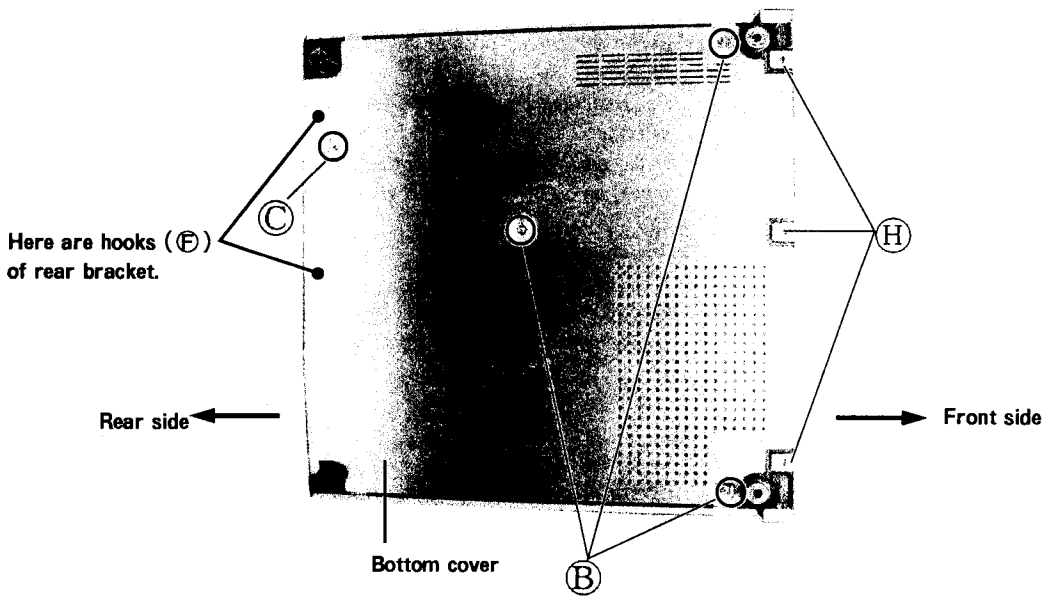


Fig.1-2-4

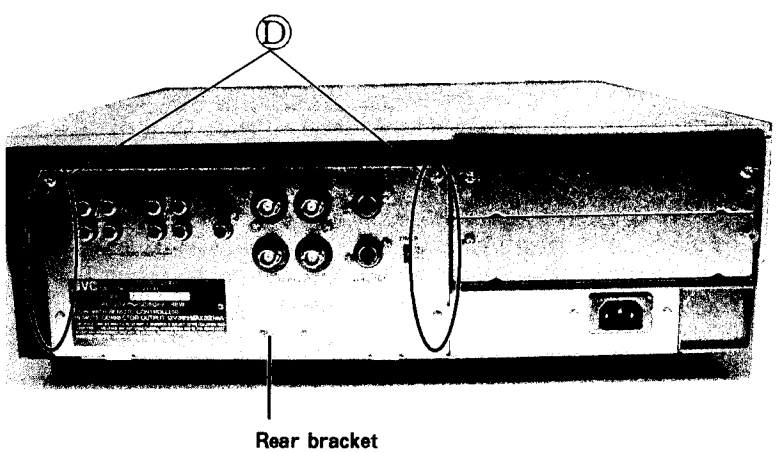
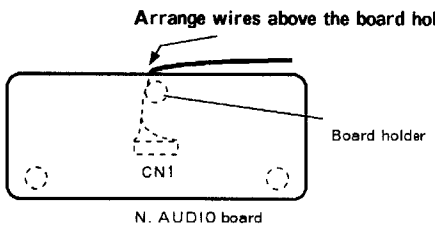


Fig.1-2-5

1. 3 REMOVAL OF MAIN BOARDS

Note :
When removing and reinstalling boards, make sure that the power is disconnected (power cord is disconnected from the AC outlet) beforehand.
When reinstalling boards and connectors that were once removed or disconnected, make sure to set and connect them as they were before removal.

Board Name	Cover to remove	Description
[1][0] VIDEO-1 [1][1] VIDEO-2	Top cover	1. Loosen the setscrew of the holder Ⓐ and turn the holder Ⓐ upwards. 2. Lift the desired board upward and take it out. (Disconnect the connector of the desired board if there is.) ***Note :*** • ***The N. AUDIO board is connected with the FM AUDIO board.*** • ***When connecting the wires originating from the connector CN1 of the NORMAL AUDIO board, arrange them so as to pass above the upper side of the board holder.*** 
[2][0] FM AUDIO [2][1] N. AUDIO (BR-S800) [2][2] N. AUDIO (BR-S500)		
[2][3] AV I/O		
[3][1] SYSCON		1. Loosen the setscrew of the holder Ⓑ and slide the holder Ⓑ. 2. Lift the desired board upward and take it out. ***Note :*** ***For removing the SW. REGULATOR board, remove four screws retaining it to the chassis.*** ***If the wire clamp on the bottom is removed, the SW. REGULATOR board can be taken out as it is assembled with the original wiring.***
SW. REGULATOR [6][0] PRIMARY [6][1] SW. REGULATOR [6][2] REGULATOR		
[1][2] AV PRE/REC		1. Remove two screws retaining the AV PRE/REC board to the drum base. 2. Disconnect all connectors of the board.
[3][0] SERVO M-CTL	Bottom cover	1. Disconnect all connectors of the board. 2. Loosen the two setscrews and open the board at an angle of 45° 3. Remove the board from the holder.
[4][0] REAR	Rear bracket	1. Remove the screws retaining the rear bracket and REAR board together with. 2. Remove the REAR board from the rear bracket.
OPERATION [3][2] OPERATION-CPU [3][3] OPERATION-VR [3][4] OPERATION-SW [3][5] OPERATION-DIAL	Front panel	1. Remove the screws retaining the boards to the chassis. 2. Disconnect all connectors of the boards. 3. Pull the boards frontward to remove them together. ***Note :*** ***For removing the OPERATION-CPU board, it is required not only to remove the OPERATION-VR board beforehand but also to pay the most careful attention to the board connector because the OPERATION-CPU board is directly connected to the MOTHER-1 board with the connector.***

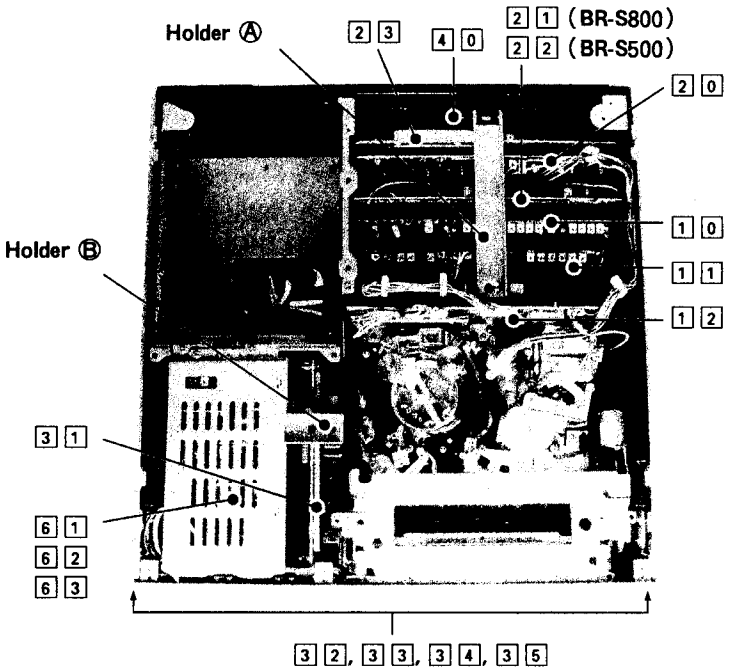


Fig.1-3-1

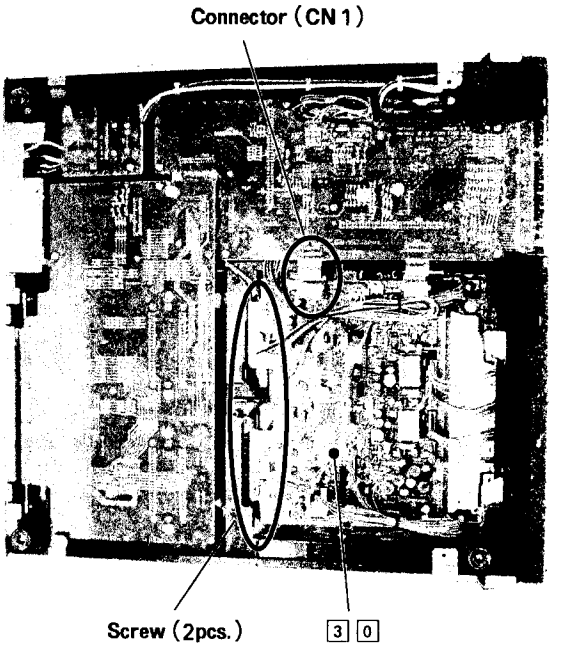


Fig.1-3-2

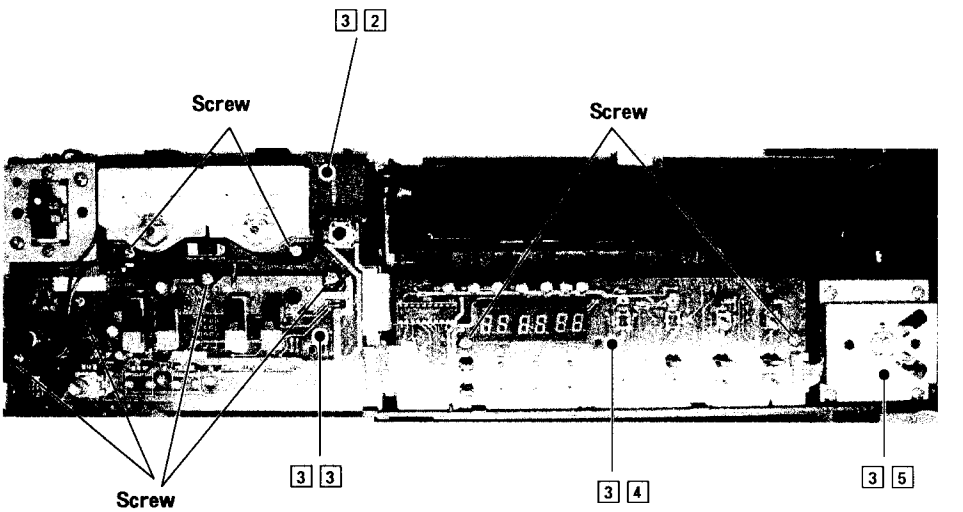


Fig.1-3-3

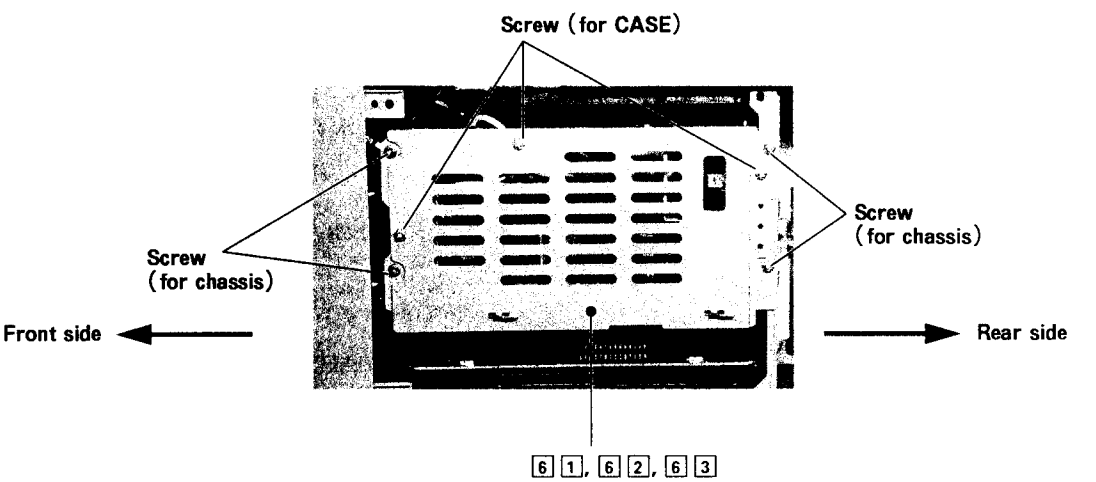


Fig.1-3-4

1. 4 INTERCHANGEABILITY OF BOARD ASSEMBLIES

The BR-S800U/BR-S500U has been improved in the circuitry in order to improve unstable vertical hold in the Linear Slow STILL mode. With the improvement, lately manufactured sets have some new boards (mentioned below) that are not interchangeable with those of the previous sets.
Under the circumstances that formerly used boards won't be supplied for replacement after those are out of stock, service engineers will be required to replace old boards with new boards which need slight modification for replacement.
This section gives a description of modifying methods for the respective boards in order to realize interchangeability between the new boards and old boards.

Note :

If the following boards are replaced with new ones for the previous set that was manufactured without the improvement of this time, it does not improve unstable vertical hold observed in the previous set.

1.4.1 Board assemblies to be replaced with new ones (AV PRE/REC, VIDEO-2, MCTL/SERVO boards)

Board name	BR-S800	
	Before improvement	After improvement
AV PRE/REC	PRK20222A-02 and before	PRK20283A
VIDEO-2	PRK20228A-06 and before	PRK20228A-07
M-CTL/SERVO	PRK10135A-02 and before	PRK10175A
Board name	BR-S500	
	Before improvement	After improvement
AV PRE/REC	PRK20222B-02 and before	PRK20283B
VIDEO-2	PRK20228B-06 and before	PRK20228B-07
M-CTL/SERVO	PRK10135A-02 and before	PRK10175A

1.4.2 Parts necessary for modification

1. AV PRE/REC board

DTC144EK	TRANSISTOR	1 piece.
QRD161J-0R0	RESISTOR	1 piece.
QRD161J-103	RESISTOR	1 piece.
PU59555-106	CONNECTOR	1 piece.
PRD42674	SHIELD CUSHION	3/20 pieces.

2. VIDEO-2 board

QRD161J-0R0	RESISTOR	1 piece.
PRD42674	SHIELD CUSHION	1/20 piece.

3. MCTL/SERVO board

PU59555-106	CONNECTOR	1 piece.

1.4.3 Modification of respective boards

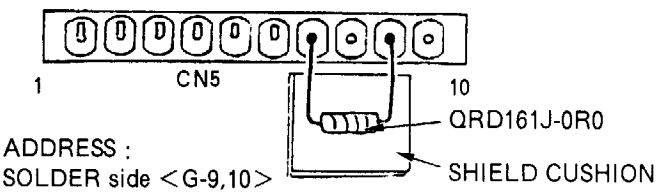
For equipping previously marketed sets with the new boards, they need such modification as mentioned below.

1. AV PRE/REC board

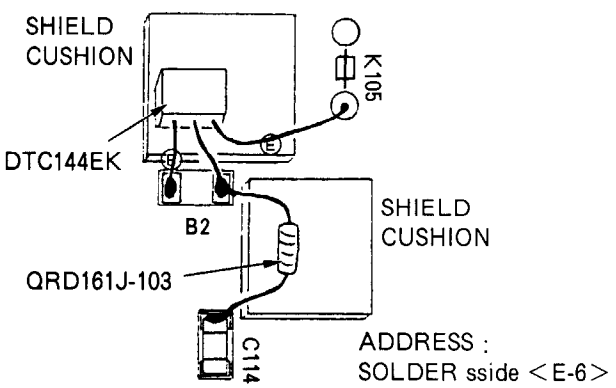
①Replace the connector CN5 of PU59555-110 with a 6pin connector PU59555-106. When fitting a new connector to the board, set its pin1 to the corresponding position of the former connector's pin1.

PU59555-110 (10pin) → PU59555-106 (6pin)

②Make a shortcircuit between the pin7 and pin9 of the 10pin connector CN5 with a resistor QRD161J-0R0.

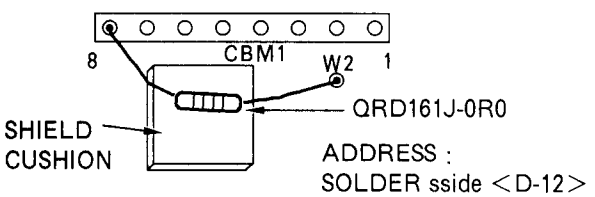


③Cut off B2 (QRSA08J-0R0) from connection.
④Additionally connect a transistor DTC144EK and a resistor QRD161J-103 to the board circuit from the back side as shown below.



2. VIDEO-2 board

①Remove the wire W2.
②Additionally connect a resistor QRD161J-0R0 to the board circuit from the back side as shown below.



3. MCTL/SERVO board

①Replace the connector CN4 (Adress: F-1) of PU59555-110 with a 6pin connector PU59555-106. When fitting a new connector to the board, set its pin1.

PU59555-110 (10pin) → PU59555-106 (6pin)

②Replace the IC18 (EP-ROM, part No. PGD30620C-17-××) of the new board with the IC (PGD30620C-12-××) used in the former board.

PGD30620C-17-×× → PGD30620C-12-××

1.5 EEPROM

Both the BR-S800U(A) and BR-S500U(A) employ the following EEPROM's which various data are stored in.
When any of these EEPROM's is replaced, enter necessary data into the newly installed EEPROM.

Board Name	Symbol No. (Part No.)	Stored Data
SYSCON	IC3 (BR24C01AF)	1. EEPROM ID code. (If the ID code is not written in EEPROM, Syscon CPU writes the ID code and the initial data.) 2. Memory switch setting data. 3. User setting of Memory switch. 4. Memory switch No. selected last. 5. Serial No. 6. Repeat mode setting data. 7. Tracking preset data. *1 (See section 2.6 No. 5) 8. Warning history.
M-CTL/SERVO	IC15 (BR24C02F)	1. Whether the set has fallen into the warning mode of "02" or "70" or not. 2. All hour meter information. 3. Adjustment data of the following items; ① Loading to torque *1 (See section 2.5 No. 4) ② ERF/REV torque *1 (See section 2.5 No. 6) ③ PALY/FWD back tension *1 (See section 2.5 No. 3) ④ Take-up torque *1 (See section 2.5 No. 5) ⑤ Switching point *1 (See section 3.2 No. 2) ⑥ Slow tracking preset *1 (See section 3.3 No. 26) ⑦ Reel FG duty *1 (See section 3.2 No. 1) ⑧ Capstan FG gain and duty *1 (See section 3.2 No. 1) ⑨ EP tracking preset *1 (See section 3.2 No. 3)
FM AUDIO	IC10 (BR24C01AF)	1. Adjustment data. *1 (See section 3.3.2)

*1: When the IC concerned with the noted item is replaced, perform the noted adjustment without fail.

Table 1-5-1 STORED DATA IN EEPROM

SECTION 2
MECHANISM ADJUSTMENT

2.1 GENERAL DESCRIPTION

2.1.1 Precaution

(1) Before use of a soldering iron, make sure to disconnect the power cord of the set from the outlet.
(2) Do not pull connector cables strongly for disconnecting connectors.
(3) Do not disturbe VRs and other controls unreasonably as the set has trouble of unknown origin.
(4) When inserting a cassette tape into the cassette housing, don't do it if the set is not placed right such as it is laid on its side, rear, top, or so. Otherwise the cassette housing may be damaged.

2.1.2 Jigs and special tools for mechanism adjustment

The following jigs and special tools are necessary for adjusting the mechanism.

General tools Besides the below special tools and jigs, the following general tools are necessary.

- Nut driver (5.5 mm)
- Hex. keys (0.9 mm, 1.27 mm, 2 mm)
- Ordinary screwdrivers (−) (No. 1, No. 2)
- Torque driver (+)
- Phillips head screwdriver (+)
- Spacers (0.1 mm)

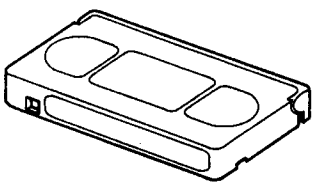
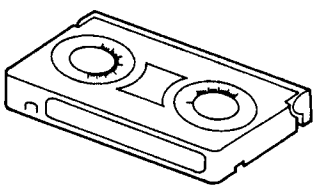
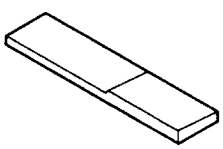
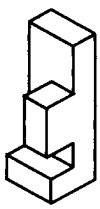
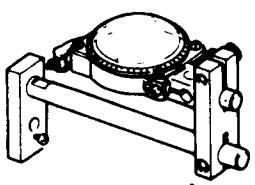
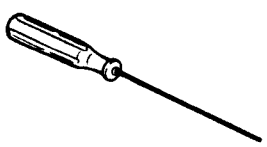
Alignment tape MHP,MBA,MBA-3,MBP-X	Cassette torque meter PUJ42881/PUJ42881B	Parallel check plate PGJ04035(0.05)/PUJ50204(0.1)	Height gauge PGJ04032
			
Line head wrench PGJ04033	Microchecker PUJ49712-2	Hex. driver PGJ04034(2mm)	
			

Table 2-1-1

2.1.3 Specifications of alignment tapes

•MHP

Video signal	N. Audio signal	Application	Remark
VHS (SP mode) Stairstep	7kHz	For check and adjustment of interchangeability. For adjustment of PB switching point.	Stairstep segment of MH-1 tape is substitutable.

•MBA

Video signal	N. Audio signal	Application	Remark
CTL signal only	1kHz	For check and adjustment of audio PB circuit.	1 kHz segment of MH-1 tape is substitutable.

•MBA-3

Video signal	Audio signal	Application	Remark
–	1kHz (Guard band recording)	For rough adjustment of stereo A/C head height.	Tape that MHA-3 is changed just in the name.

•MBP-X

Video signal	N. Audio signal	Application	Remark
Stairstep (SP) (Non-recorded feiled every 5 frames)	7kHz	For adjustment of X-value.	Tape that MHP-X is changed just in the name.

2.2 MAINPARTS REPLACEMENT TABLE

Periodic inspection and maintenance are important to ensure the original capacity and reliability of the set. The following table shows just a maintenance and replacement standard that is compiled based on general and average use of the set. In actual, the periods will widely vary depending on environmental and usage conditions.

If the inspection and maintenance work of the following items are improperly performed, it not only shortens the periods but also gives bad influence on the set. Also keep it in mind that rubber parts may deform and age even when the set is not used and the service life of the upper drum is particularly affected by environmental and usage conditons.

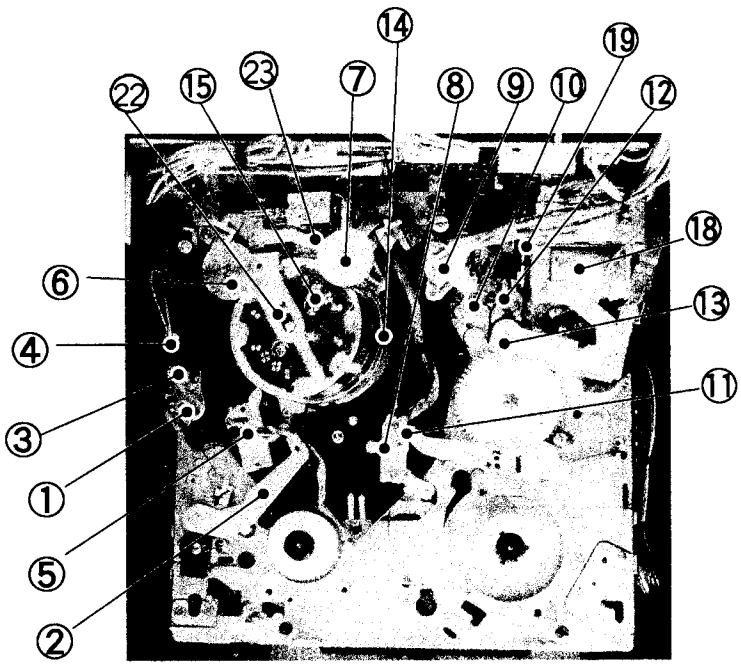
	No.	Part Name	Part Number	Standard service period ※				Ref. Sect.	Remark
				1000	2000	3000	4000		
Tape transport system	①	Supply guide shaft	—	★	★	★	★	—	
	②	Tension arm assembly	PRD43638A-01					2.3.7	
	③	Supply guide roller	PRD43721A					2.7.2	
	④	Full erase head (BR-S800)	PGZ01841					—	
	⑤	Supply pole base assembly	PRD30809A					2.3.13	
	⑥	Supply inertia roller	PGZ01920					2.3.2	
	⑦	Take-up inertia roller	PGZ01920-02	★	★	★	●	2.3.2	
	⑧	T.U. pole base assembly	PRD30811A-04					2.3.13	
	⑨	A/C head	PGZ01840					2.3.6	Excluding A/C head board
	⑩	Take-up guide roller	PRD44151A-01					2.7.3	
	⑪	Guide arm roller assembly	PRD43658A					2.7.4	
	⑫	Capstan shaft	—	★	★	★	★	—	
	⑬	Pinch roller arm assembly	PRD43387A-01	○	●	○	●	2.3.8	
	⑭	Drum assembly (BR-S800) Drum assembly (BR-S500)	LDR2001A LDR2002A	★	★	○	●	2.3.5	
	⑮	Upper drum assy (BR-S800) Upper drum assy (BR-S500)	PRD20458A PRD20485A	●	●	●	●	2.3.2 / 2.3.3	Included in Drum assembly
Drive system	⑯	Capstan motor	PGZ01535-01-01				●	2.3.9	
	⑰	Reel motor	PGZ01958A				●	2.3.10	Assembled part
	⑱	Mode motor	PRD44123A				●	2.3.11	
	⑲	Loading belt	PRD30022-17 PRD30022-18	●	●	●	●	—	Motor side Worm gear side
	⑳	Cassette housing	PGS21023A-01				●	2.3.1	
	㉑	Reel brake	PRD43479A-01		●		●	2.3.12	
Others	㉒	Brush assembly	PRD44288A		●		●	2.3.2	Included in Drum assembly
	㉓	Head cleaner	PQ44837	●	●	●	●	—	Not included in Drum assembly

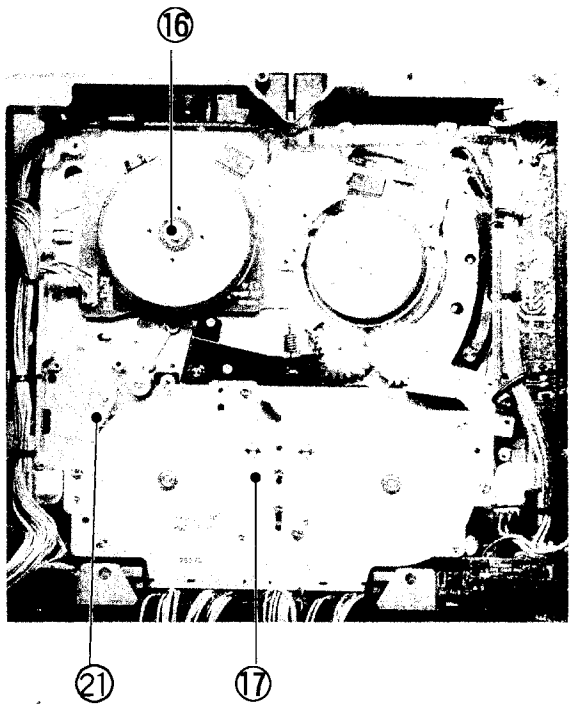
※ For service hours, follow the indication of the hour meter of the drum in principle.

★=Cleaning
○=Check and Replace if necessary, or Check and Clean
●=Replacement

2.2.1 Location of main parts

For names of respective parts indicated by numbers, refer to the table on the previous page.





2.2.2 Cleaning

Periodical cleaning of the tape transport system is desirable, however, it is almost impossible to put it into practice on schedule. Therefore, it is strongly recommended to clean the tape transport system when a set is brought in for repair, etc. For cleaning, use fine wooven cotton cloth (like cotton shirting) moistened with ethylalcohol.

(1) Dirty video head causes rough playback picture and non-reproduction of picture in an extreme case.
To clean the video heads, lightly press such cotton cloth as mentioned above to the upper drum while turning the upper drum.

Note:

Do not move the cleaning cloth on the upper drum since the video head is weak against vertical force. Otherwise, the video heads may be damaged.

(2) Dirty tape guide not only gets the video heads dirty much more but also damages tapes.

(3) Dirty and dusty brush causes snow noise in playback picture and non-picture reproduction.

Note:

When reinstalling the brush after cleaning, apply BEACON-325 grease to the drum shaft by the part where it contacts the brush, otherwise, it may cause jitters or other noise.

2.2.3 Oiling and greasing

If oil or grease on the other party is dirty and aged in case of parts replacement, wipe it off and apply new oil or grease as well as to do it for new parts.

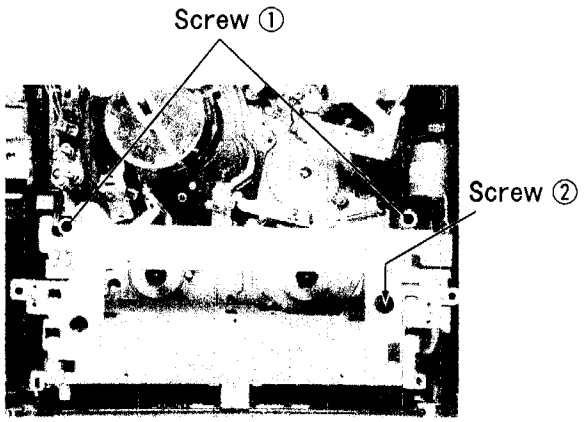
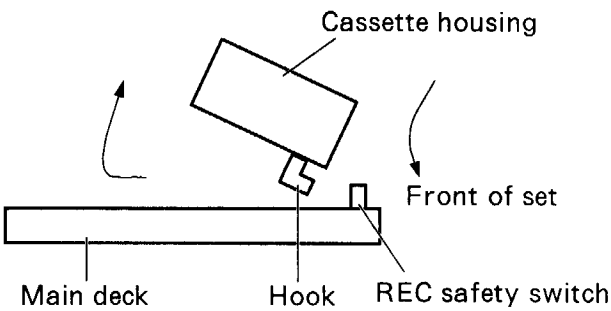
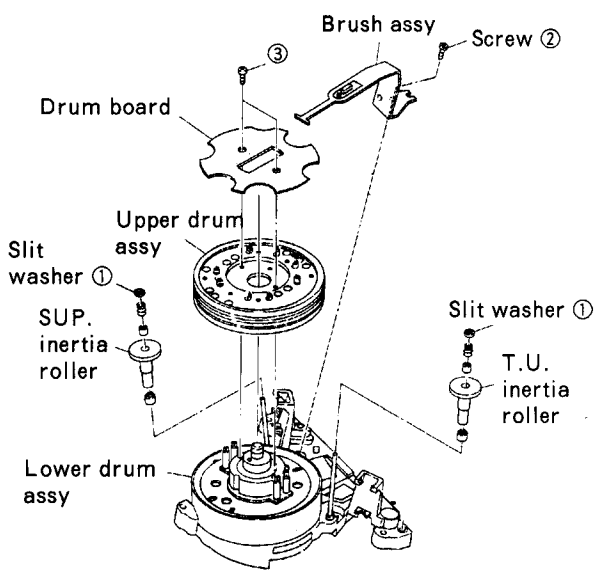
(1) Oil and grease used in this set are as follows.

Item	Name	JVC Part No.
Oil	Cosmo Hydro HV56	COSMO-HV56
<General spindle oil (low viscosity) is substitutable>		
Grease	Moriton Grease (Black)	MOS2-C
	Fuloil G-31KAV (light blue)	KANTO-G-31KAV
	FULOIL GB-TS-1 (brass)	KANTO-GB-TS-1

(2) Grease the control cam every 2000 hours of operation.

(3) For other parts, apply grease to them every 4000 hours of operation or on parts replacement.

2.3 REPLACEMENT OF MAIN PARTS

No.	Item	Adjustment & Check
1	**Cassette housing assembly**  Fig.2-3-1 Removal of cassette housing assy	***Note:*** ***When reinstalling the cassette housing assembly to the set, do it as the front panel is taken off otherwise the REC safety switch may be damaged.*** (1) Take out the front panel assembly. (Section 1.2) (2) Remove two screws ① and one screw ②. (3) Push the cassette housing toward the drum once to release it from the hook, and lift it upward while disconnecting the housing connector and taking it out.  Fig.2-3-2 Reinstallation of cassette housing assy
2	**Removal of upper drum assembly**  Fig.2-3-3 Removal of upper drum assembly	(1) Remove two slit washers ① and then remove the inertia roller with careful attention to spring, etc. not to lose them. ***Note:*** ***When the slit washer is removed, replace it with new one (Part No. PQM30017-25).*** (2) Remove the head cleaner assembly. (3) Remove one screw ② and then remove the brush assembly. (4) Unsolder on the DRUM board and remove solders. (5) Remove two screws ③ and take out the upper drum assembly.

No.	Item	Adjustment & Check
3	**Reinstallation of upper drum assembly**	(1) Clean the respective contact surfaces of upper drum assembly and the lower drum assembly with alcohol. (2) Install the upper drum assembly so as to face the hole "A" (ϕ2.7mm) of the upper drum and the hole "B" (ϕ1.6 mm) of the flywheel right opposite to each other (at an angle of 180. For fixing them, tighten the screws ③ with a torque of 0.441 to 0.49 N.m. (3) Proceed to check the "Centering of upper drum" (subsection 2.3.4, steps (1) through (9)). (4) After confirming the upper drum centering, solder the DRUM board. (5) Reassemble the brush assembly and the head cleaner assembly to the drum assembly. ***Note :*** ***When reinstalling the brush after cleaning, apply BEACON-325 grease to the drum shaft by the part where it contacts the brush, otherwise, it may cause jitters or other noise.*** (6) After the adjustment, proceed to the following check and adjustment.

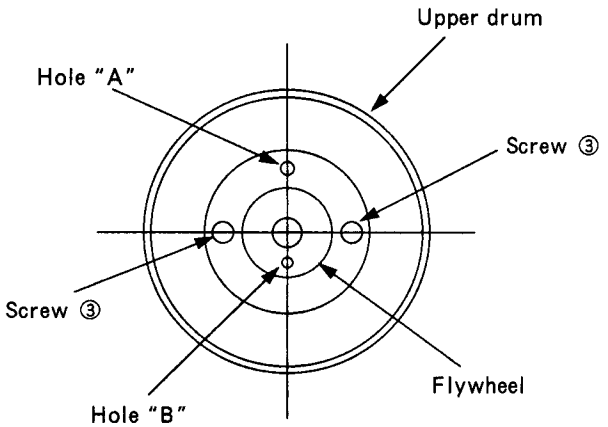
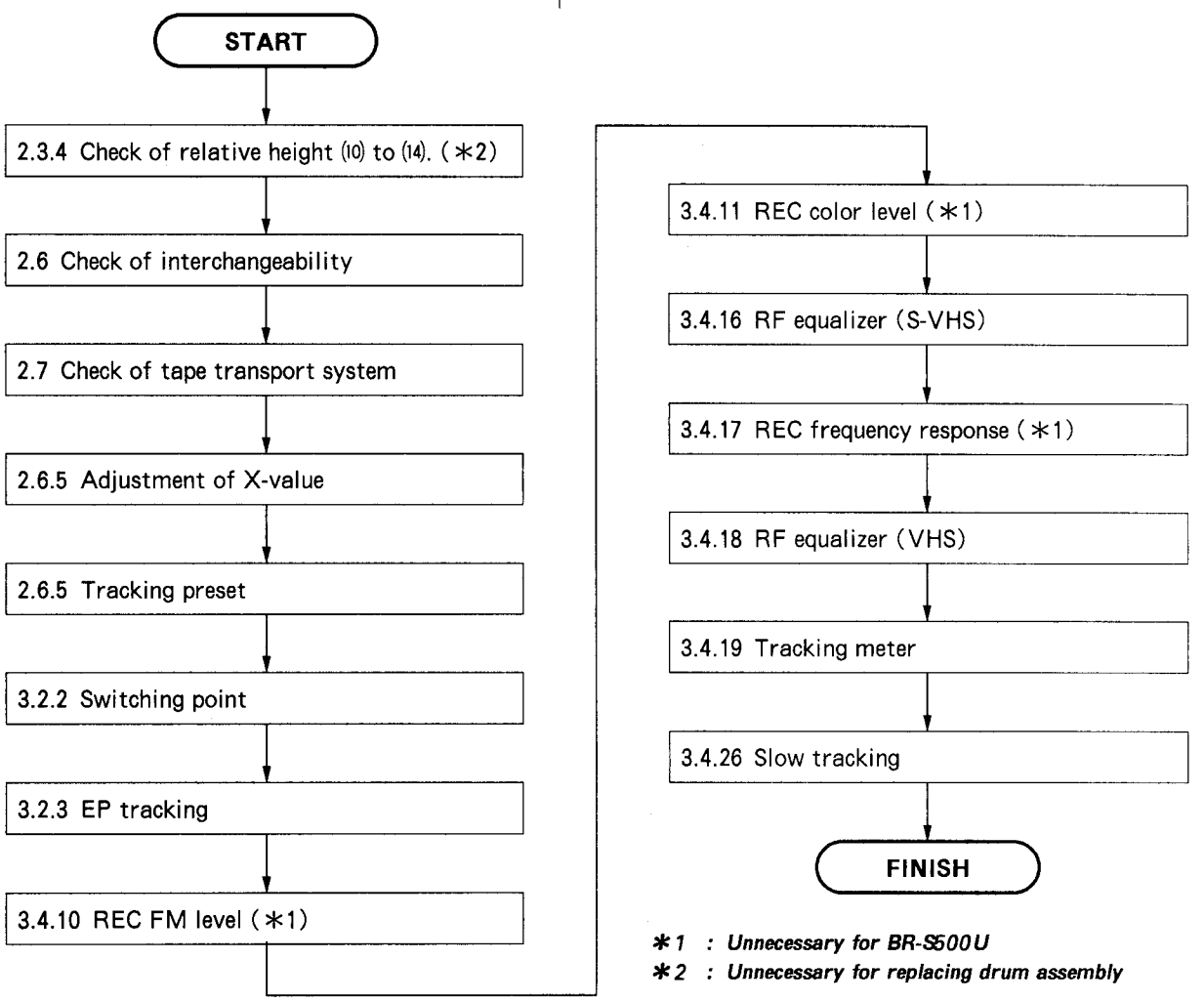


Fig.2-3-4 Reinstallation of upper drum assy

— Check and adjustment —



****1 : Unnecessary for BR-S500U***
****2 : Unnecessary for replacing drum assembly***

No.	Item	Adjustment & Check
4	Centering of upper drum If the upper drum is installed being deviated from the center of the drum shaft, it causes jitter, etc. When the upper drum is replaced, make sure that no wobbling is observed in the upper drum rim.	

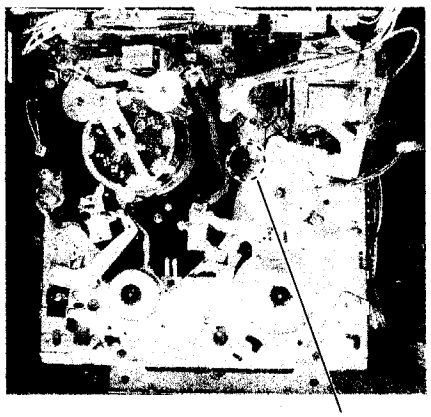
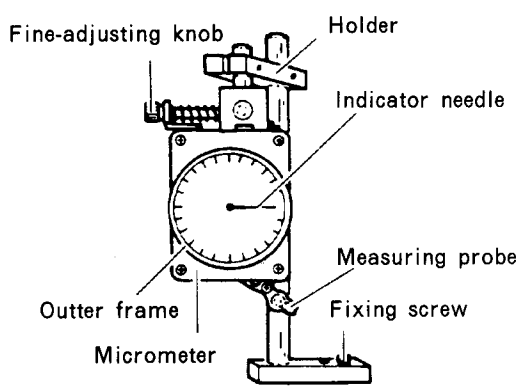


Fig.2-3-5 Mounting of microchecker

- Cautions on handling of microchecker

① Keep the microchecker out of any shock or strong vibration since it is a high precision instrument.
② Do not apply unnecessary force to the microchecker's probe.
③ Although the outer ring of the microchecker can be turned in a range of 0 graduations, do not turn it with strong force (more than 300 g-cm).
④ Be careful not to touch the microchecker's probe with the heads, particularly with the video heads.
⑤ On setting the microchecker, make sure that the working direction of the probe points at the center of the upper drum.
⑥ If rubbing or grating sound occurs in measuring, it results from bad setting or abnormal contact of the microchecker. Check that there is neither dust nor foreign substance on the upper drum and tip of the probe.



Microchecker : PUJ49712-2

Note : For centering the upper drum, a setscrew (SDSP2610Z) is necessary besides a microchecker.

(1) Turn the mode motor counterclockwise (toward the rear side) to enter the set into the loading end state.

(2) Remove the hex. screw from the base of the microchecker.

(3) Set the microchecker holder at the place shown in Fig. 2-3-5 and fix it with a fixing screw (SDSP2610Z).
Notes:
- ***It is allowed to mount the microchecker holder at the place where the earth plate is installed under the cassette housing assembly.***
- ***If there is no internal thread for the specified screw at the place shown in the figure, use a tapping screw (SDST2608Z) to fix the microchecker holder.***

(4) Mount the microchecker with care not to knock the upper drum with it.

(5) Slowly turn the microchecker's fine adjustment knob clockwise so that the pointer indicates "0" graduation. Pointer adjustment is also possible by turning the outer ring of the microchecker, but the adjustable range is limited within 0 graduations. To apply the microchecker to the drum assembly, plae it between the 4th and 5th grooves of the drum from the top.

(6) Turn the upper drum gently with care not to apply lateral pressure to it. (Turn it with a paper string, for example). If the pointer deflects, it must be within micron at maximum.

(7) When the pointer deflection exceeds micron, turn the fine adjustment knob counterclockwise and remove the probe from the upper drum. Then, loosen two screws retaining the upper drum while adjusting the upper drum position slightly. Tighten the two screws again.

(8) Repeat check of pointer deflection and adjustment of the upper drum position until pointer deflection becomes within micron.

(9) When dismounting the microchecker, turn the fine adjustment knob counterclockwise first.

— Check of relative height —

(10) Turn on the power switch.

(11) Connect the oscilloscope to TP101(:8F) on the 1 2 AV PRE/REC board and play back the MHP alignment tape.

(12) Turn the TRACKING VR to check that waveforms of CH1 and CH2 become maximum at the same time.

(13) If there is a remarkable time lag and level difference between the two channels, remove the upper drum once and clean the upper surface of the flywheel of the lower drum. Fit the upper drum again and repeat the above steps (1) through (12).

(14) If the result of repeated adjustments of the steps (1) through (13) does not meet the requirement, replacement of the drum assembly is recommended.

No.	Item	Adjustment & Check
5	**Drum assembly** **(Upper drum + Lower drum + Inertia rollers + Brush)**	***Note:*** ***When holding the drum assembly, make sure not to touch the brush assembly. When replacing the pole base, do it as the drum assembly is removed.*** (1) Remove the 1 2 AV PRE/REC board. (2) Remove the head cleaner assembly. (3) Disconnect the connector (bottom side) and remove three screws ①, then remove the drum assembly to replace it with another. (4) After replacement of the drum assembly, conduct check and adjustment according to the flowchart illustrated in page 2-5.
	— **Reference** — **Before replacing drum assembly.**	(1) Connect the oscilloscope to TP101(:8F) on the 1 2 AV PRE/REC board and trigger it externally with signal of TP102(:7G) on the same board. (2) Play back the MHP alignment tape while observing the waveform with turning the TRACKING VR. (3) When the waveform in the supply side shows such a tendency as shown in the figures, the drum lead is worn out and needs to replace.

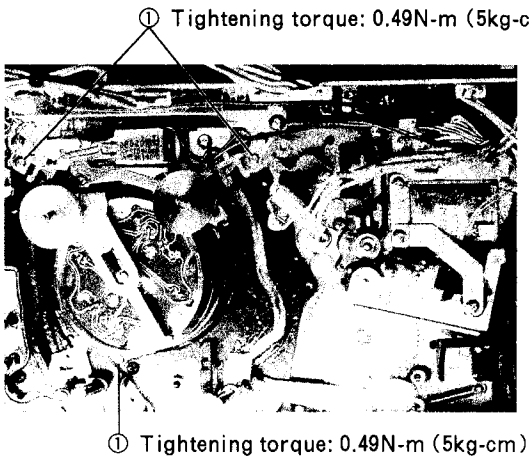
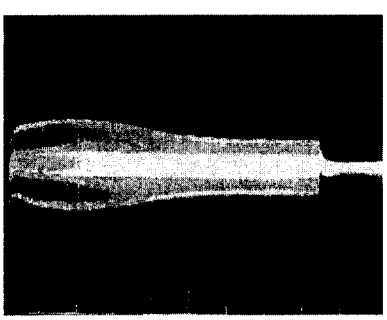
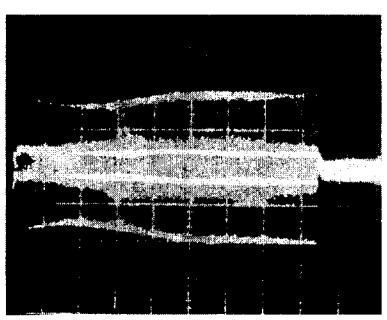


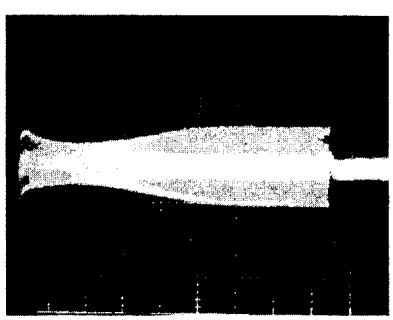
Fig.2-3-6 Removal of drum assembly



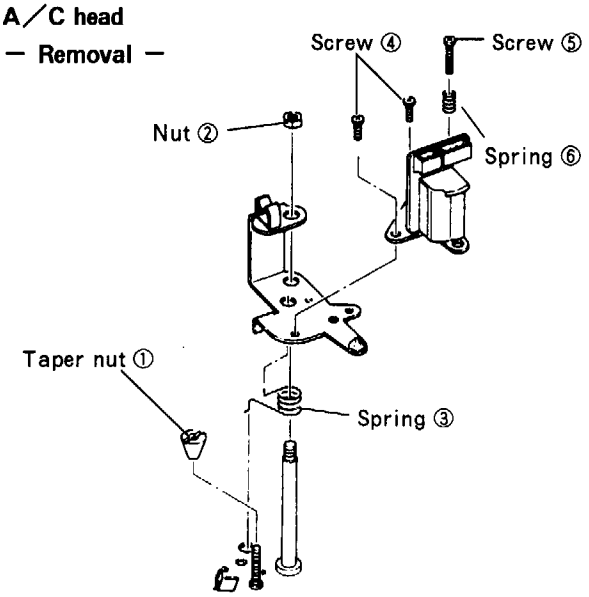
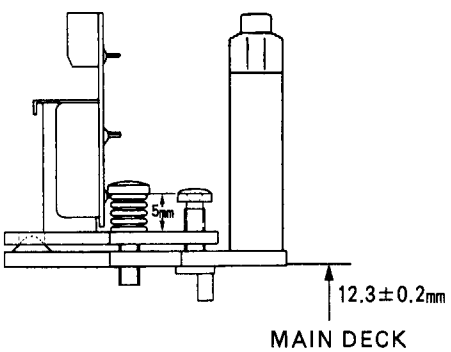
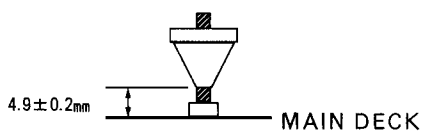
Tracking (−)

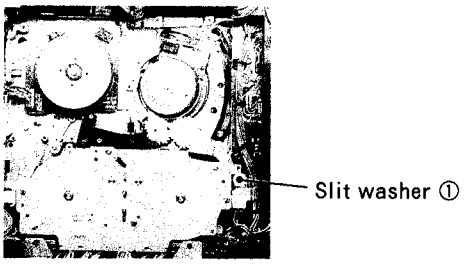
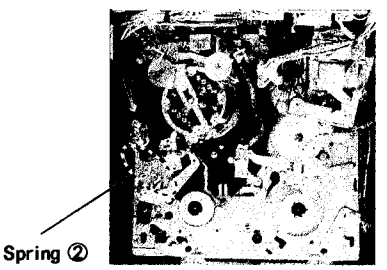
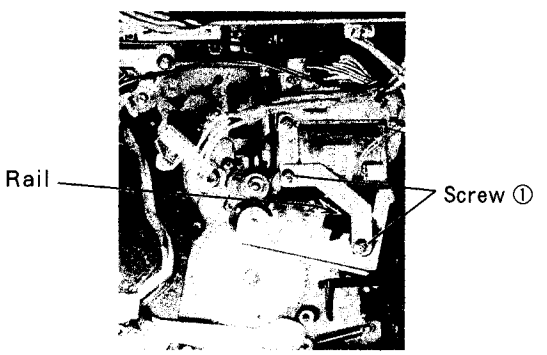
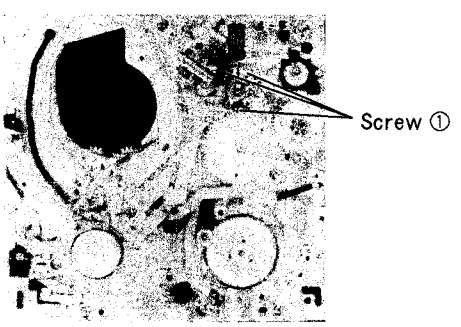


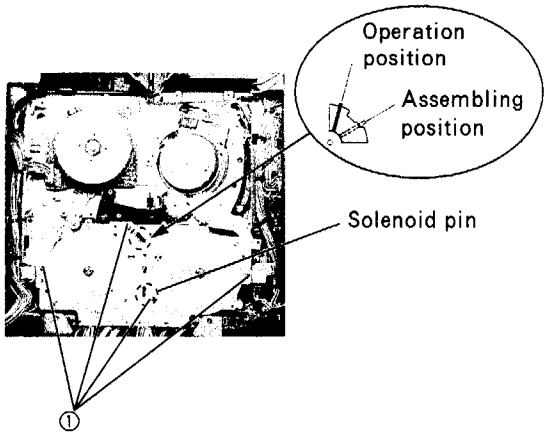
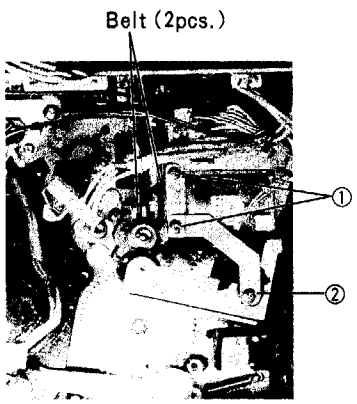
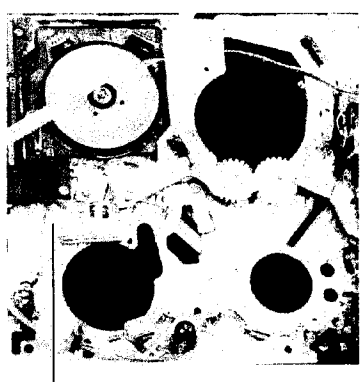
Tracking center



Tracking (+)

No.	Item	Adjustment & Check
6	**A/C head** **— Removal —**  Fig.2-3-7 Removal of A/C head	(1) **Tools to prepare:** • **Ordinary screwdriver** (−) • **Nut driver** : 5.5mm (2) Disconnect the connectors from the A/C HEAD board. (3) Remove the taper nut ① for X-value adjustment. (4) Remove the nut ② and then remove the A/C head together with the head base with care not to lose the spring ③. (5) Remove two screws ④ and a screw ⑤ to remove the A/C head. At that time pay careful attention to the spring ⑥ not to lose it. (6) Unsolder the A/C HEAD board and replace the A/C head with new one.
	— Reinstallation —  Fig.2-3-8 Temporary installation of A/C head	(1) Before assembling the A/C head to the main deck, conduct rough adjustment of the head height as shown in Fig. 2-3-8. (2) Assemble the A/C head and its peripheral parts to the main deck in the reverse order of the disassembly. (3) When fitting the taper nut, temporarily adjust the height as shown in Fig. 2-3-9.  Fig.2-3-9 Temporary fitting of taper nut
	— Check and adjustment —	***Note:*** • ***For tape transport check to be conducted before adjustemnt, don't use any alignment tape but use a general recording tape since there is a fear of tape getting damaged.*** • ***The check and adjustment should be proceeded in the following order.*** (1) Adjustment of A/C head (see 2.6.4) (2) Check of tape transport system (see 2.7) (3) Check of X-value (see 2.6.5) (4) Check of FM waveform (see 2.6.2) (5) Automatic adjustment of audio circuit (see 3.3)

No.	Item	Adjustment & Check
7	**Tension arm assembly** **— Removal —**  Fig.2-3-10 Tension arm ass'y (bottom side)	(1) Remove the cassette housing assembly. (2) Open the SERVO／M-CTL board at an angle of 90(to stand it upright). (3) Remove a slit washer ①. (4) Remove a spring ② engaged between the tension arm assembly and the spring adjust assembly, and then lift the tension arm assembly upward to remove it. ***Note:*** ***Replace the slit washer removed once with new one (Part No. PQM30017).***
	— Reinstallation —  Fig.2-3-11 Tension arm ass'y (top side)	(1) Reassemble the tension arm assembly and its peripheral parts to the main deck in the reverse order of the disassembly. (2) After replacement, conduct the following check and adjustment. ① Adjustment of tape transport system (see 2.7) ② Adjustment of reel servo circuit (see 2.5)
8	**Pinch roller arm assembly**  Fig.2-3-12 Removal of pinch roller arm assy	***Note:*** ***Proceed to do the following work in the Assembly mode (see 2.4.1).*** (1) Remove two screws ① and lift the pinch roller arm assembly upward to remove it. (2) When reinstalling, do it so as to position the cam of the pinch roller assembly on the rail of the solenoid bracket in the assembly mode.
9	**Capstan motor**  Fig.2-3-13 Removal of capstan motor	(1) Remove the pinch roller assembly referring to 2.3.8. (2) Remove three screws ① and disconnect all connectors, and then remove the capstan motor. (3) After replacement, conduct the adjustment of FG duty ratio. (Refer to 3.2.1.)

No.	Item	Adjustment & Check
10	**Reel motor**  Fig.2-3-14 Removal of reel motor	(1) Position the sensor LED at the assembling position as shown in Fig. 2-3-14. (2) Turn the mode motor counterclockwise (toward rear side) to enter the set into the loading end state. (3) Remove four screws ① and remove the reel motor assembly. (4) Set a new sensor LED of the reel motor at the assembling position. (5) Position the sensor LED at the operation position. (6) After replacement, conduct the adjustment of FG duty ratio (see 3.2.1).
11	**Mode motor**  Fig.2-3-15 Removal of mode motor	(1) Disengage the belt from the motor pulley. (2) Remove two screws ① and one screw ②, and then remove the mode motor together with the motor bracket. (3) Disconnect a connector from the mode motor and remove it.
12	**Reel brake assembly**  Fig.2-3-16 Removal of reel brake	(1) Remove the SERVO/M-CTL [3][0] board. (2) Remove the reel motor. (Refer to 2.3.10.) (3) Remove a slit washer and then reel brake assembly. ***Note:*** ***When a slit washer is once removed, replace it with new one (PQM30017-6).***

No.	Item	Adjustment & Check
13	**Pole base assembly and loading arm assembly**	(1) Remove the drum assembly. (Refer to 2.3.5)

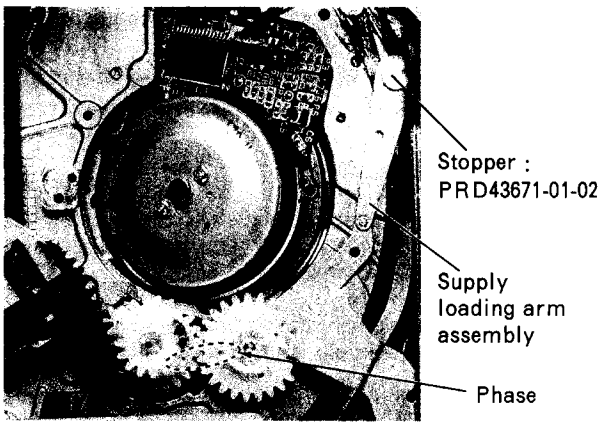


Fig.2-3-17 Sub-deck (bottom view)

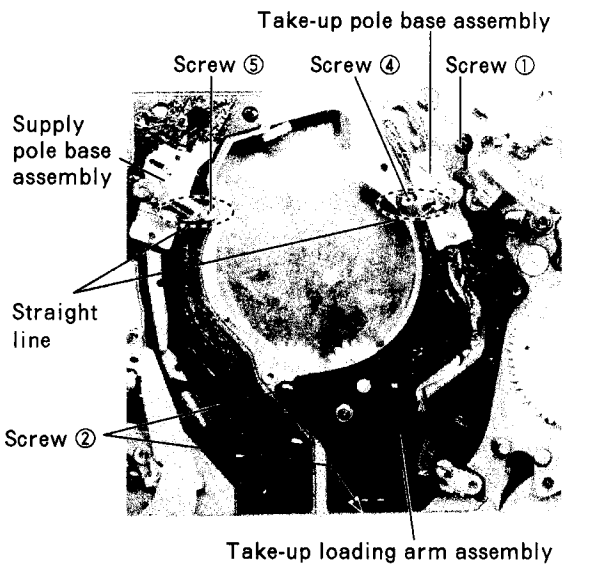


Fig.2-3-18 Sub-deck (top view)

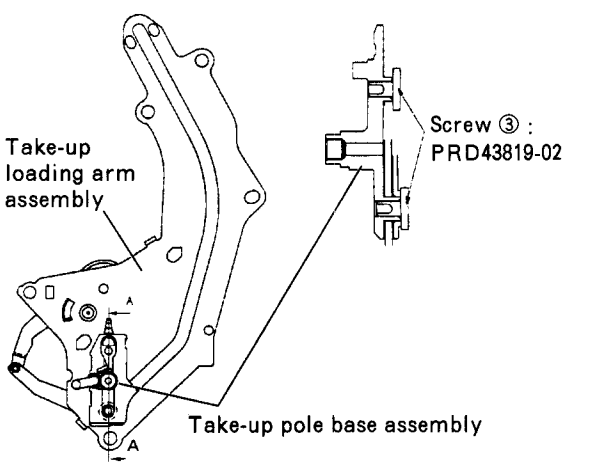


Fig.2-3-19 Removal of take-up pole base assy

(2) — Removal of take-up pole base assembly —

1 Remove a screw ④. (Fig.2-3-18)

2 Turn the mode motor counterclockwise and stop it when the slant pole on the pole base assembly is positioned near by the hole for the screw ④. (Fig.2-3-18)

3 Remove a screw ① and two screws ②, and remove the take-up loading arm assembly. (Fig.2-3-18)

4 Remove two screws ③ and lift the take-up pole base assembly upward to remove it. (Fig.2-3-19)

(3) When reassembling, proceed as mentioned below.

1 Align the supply slant pole with the screw ⑤ in a straight line. (Fig.2-3-18.)

2 Set the take-up slant pole in the position mentioned in the above step (2), and reinstall the loading assembly to the mechanism.

3 Make sure that the supply slant pole, screw ④, screw ⑤ and take-up slant pole are aligned in a straight line, and then fix the take-up pole base ass'y with the screws ①, ② and ④.

---

(4) — Removal of supply pole base assembly —

1 Turn the mode motor counterclockwise to set the mechanism to the loading end position.

2 Remove the stopper and lift the pole base assembly to remove it. (At that time, pay attention to the collar inserted between the pole base assembly and the loading arm not to lose it.)

(5) — Removal of supply loading arm assembly —

1 Remove the reel motor. (Refer to 2.3.10)

2 Remove the END SENSOR board first and then the cancel lever. (slitt washer: PQM30017-12)

3 Remove the pole base assembly to the loading arm.

4 Disengage the pawl of the gear from the shaft, and remove the supply loading arm assembly.

(6) — Reinstallation of loading arm assembly —

1 Turn the mode motor to set the mechanism in the loading end state.

2 Engage the supply loading gear so that the phases of the take-up loading gear and the supply loading gear are adjusted as shown in the figure. (Fig.2-3-17)

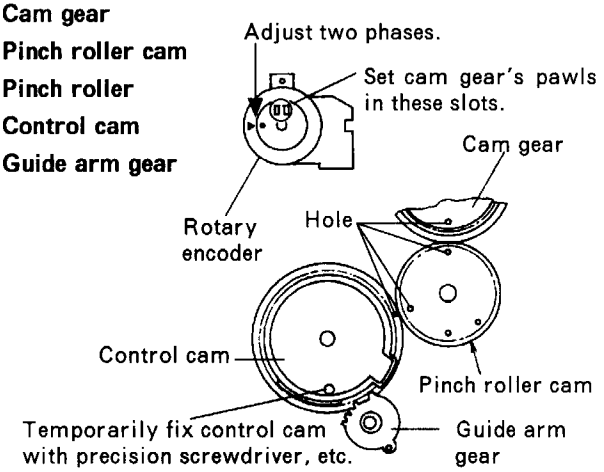
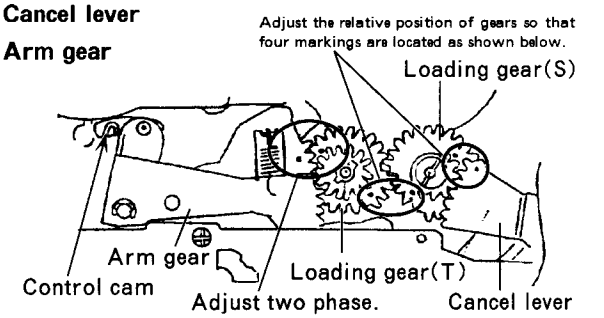
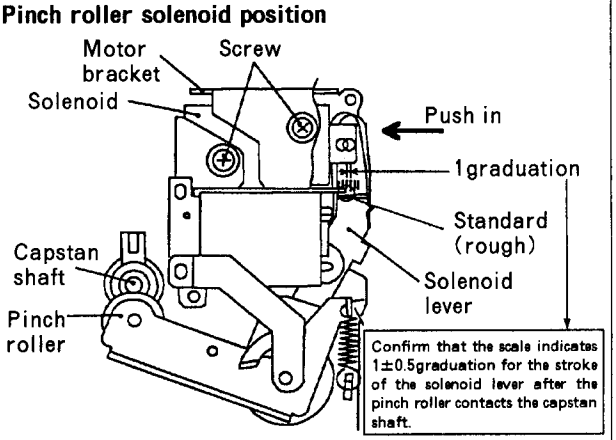
3 Reinstall the supply pole base assembly.

4 Reassemble the cancel lever, the END SENSOR board and the reel motor to the mechanism.

(7) Reinstall the drum assembly.

(8) Load the mechanism with a general recording tape, which you don't mind if gets damaged, and check the adjustment of interchangeability (See 2.6).

2.4 ASSEMBLING OF MECHANISM

No.	Item	Adjustment & Check
There is a close relation between the rotary encoder and the mechacon circuit in the mechanism of this set, namely, operation of the mechanism components is determined and conducted according to rotation angle of the rotary encoder, in other words, turning angle of of the cam gear. Therefore, if there is any component part installed abnormally in the mechanism, it causes malfunction of the mechanism. **Disassembly and reassembly of mechanism parts of this set must be performed in the assembly mode, in which the pole base assembly is once returned to the utmost reel side and then the mode motor is turned clockwise (toward front side) to position the hole of the control cam at the same angle as that of the main deck.** **Under those circumstances, make sure to conduct the following work in the assembly mode.**		
1	**Cam gear** **Pinch roller cam** **Pinch roller** **Control cam** **Guide arm gear**  Fig.2-4-1 Assembling position	(1) Adjust the phase of the control cam so that its hole overlaps the hole of the main deck, and temporarily fix the control cam with a precision screwdriver, etc. (2) As the holes of the pinch roller cam are positioned as shown in Fig. 2-4-1, assemble the pinch roller cam to the mechanism. (3) Fit the pinch roller to the mechanism. (4) Adjust the phase of the rotary encoder as shown in the figure and engage the cam gear with the pinch roller cam taking care of its phase. (5) Points of the work ① Fix the control cam with a precision screwdriver, etc. to prevent it from rotating. ② Fit the cam gear's pawl into the dimple of the rotary encoder.
2	**Loading gear (Supply)** **Loading gear (Take-up)** **Cancel lever** **Arm gear**  Fig.2-4-2 Phase	(1) Assemble the two loading gears (supply and take-up), cancel lever and arm gear so that the four holes of them are positioned as illustrated. (2) Rotate the mode motor in the loading direction (toward the rear side) by about 12 to 14 turns. (3) Engage the arm gear with the take-up loading gear so that they are so positioned as their phases set as illustrated. ***Note :*** ***Regarding the cases of (1) and (2) mentioned above, as a matter of fact the respective two holes don't face each other, because each gear doesn't turn further than a certain point. Therefore, set the respective holes in phase on the assumption that the gears are unlimitedly turned in the direction of the respective arrows (in other words, set the gears so as to make their marked teeth face the marking of the other party respectively).***
3	**Pinch roller solenoid position**  Fig.2-4-3 Positioning of pinch roller solenoid	(1) Turn the mode motor in the direction of loading (toward the rear side) to set the mechanism in the loading end state. (2) Turn the mode motor further in the same direction (toward the rear side) to move the pinch roller arm to the downmost position. (3) Push the solenoid lever (in the direction of the arrow) to make the pinch roller contact the capstan shaft. (4) Push the solenoid lever moreover from the position of the above step (3), and make sure that the stroke (additional movement of the solenoid lever) at that time is 1±0.5 graduation on the scale on the solenoid lever. (5) If the stroke is out of 1±0.5graduation, loosen the setscrews and adjust the position of the solenoid lever to meet the requirement.

2.5 ADJUSTMENT OF REEL SERVO CIRCUIT

Note : The test point of D. FF output is TP102(:7G) on the AV PRE/REC board.

No.	Item	Adjustment & Check

When setting back the cassette torque meter, make sure to do it in the Search (×11) mode. Don't do it in the FF, REW or Reel Search mode, otherwise the cassette torque meter may be damaged.
If the +SHIFT or −SHIFT button is pressed in torque adjustment, the torque changes about 2 g-cm every time it is pressed.
If the cassette torque meter reaches the tape end or the tape beginning in the following adjustment, make a fresh start from the step (1).
Test points and adjustment parts appearing in the following are located on the SERVO/M-CTL board unless otherwise specified.

1 Adjustment of tension sensor position

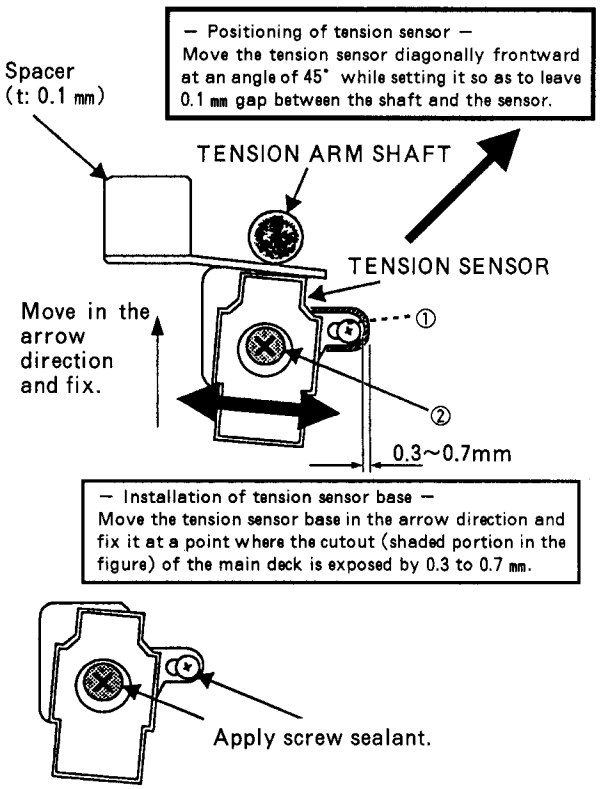

− Positioning of tension sensor −
Move the tension sensor diagonally frontward at an angle of 45° while setting it so as to leave 0.1 mm gap between the shaft and the sensor.
Spacer
(t: 0.1 mm)
TENSION ARM SHAFT
TENSION SENSOR
Move in the arrow direction and fix.
①
②
0.3~0.7mm
− Installation of tension sensor base −
Move the tension sensor base in the arrow direction and fix it at a point where the cutout (shaded portion in the figure) of the main deck is exposed by 0.3 to 0.7 mm.
Apply screw sealant.

Fig.2-5-1 Positioning of tension sensor

(1) **Required jigs:**
- **Spacer (0.1 mm) or the earth plate (PRD44276) on the sub-deck.**

(2) Turn off the power switch and remove the cassette housing assembly.

(3) Turn the mode motor counterclockwise (toward rear side) to set the mechanism in the loading end state.

(4) Loosen the screw ① and adjust the tension sensor base position so that its relative position to the cutout of the main deck is as shown in the figure. Then, tighten the screw ①. On fixing the tension sensor base, move it to the utmost end in the direction of the arrow.

(5) Slightly loosen the screw ②.

(6) Insert a spacer of 0.1 thick between the tension sensor and tension arm shaft as shown in the figure. Move the tension sensor in the diagonally frontward direction (as shown by the slant arrow) while adjusting the gap width to be 0.1 mm. Then, tighten the screw ②.

(7) Apply screw sealant onto the screws ① and ②.

(8) After the above adjustment, proceed to do the following adjustments.
① Adjustment of tension bias and gain (see 2.5.2)
② Adjustment of back tension in play mode (see 2.5.3)
③ Adjustment of reverse (×1 speed) torque (see 2.5.6)

(9) When all of the above are over, reinstall the cassette housing to the mechanism.

No.	Item	Check point	Adjustment parts	Signal	Mode	Adjustment and Check
2	**Tension bias and gain adjustment**	TP22 :14D (MCTL/ SERVO)	R222 : 14B R214 : 14C (MCTL/ SERVO)	—	E-E	(1) Turn the mode motor counterclockwise by hand to set the mechanism into the loading end state. (2) Make sure that the tension arm moves to the limit and touches the guide roller. (3) Adjust R222 to obtain 0.00 to 0.10 V as the output of TP22. ***Note:*** ***The test points and VRs can be seen if the side cover (mechanism deck side) is taken off.*** (4) Utilizing the flat portion of the parallel check plate, align the supply guide rollers 1, 2 and tension pole in a straight line. (5) Adjust R214 to obtain 1.75 to 1.95 V as the output of TP22.

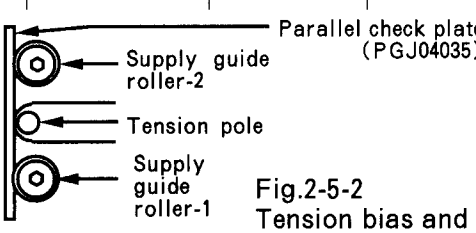
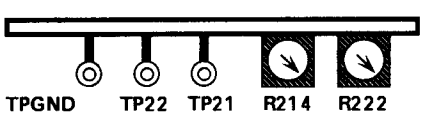


Fig.2-5-2 Tension bias and gain



Arrangement of TPs and VRs on SERVO/M-CTL board
(Exposed portion when side cover is removed)

Note : The test point of D. FF output is TP102(:7G) on the AV PRE/REC board.

<table>
<tr><th>No.</th><th>Item</th><th>Check point</th><th>Adjustment parts</th><th>Signal</th><th>Mode</th><th>Adjustment and Check</th></tr>
<tr><td>3</td><td>Back tension in play mode</td><td>Cassette torque meter (PUJ42881)</td><td>IN/+SHIFT button (up)
OUT/−SHIFT button (down)</td><td>—</td><td>adjut mode "0 C"</td><td>(1) Take the cassette tape out of the set and then turn off the power switch.

(2) Within 2 sec after the counter display is on, press the COUNTER RESET, FF and REW buttons simultaneously and "00 00" appears in the counter display to indicate that the mechanism has entered the adjustment mode.

(3) Connect a digital voltmeter to TP22 on the SERVO/M-CTL board.

(4) Press the MENU or SET button to select the adjustment of "0C", which will appear in the counter display.

(5) Set the cassette torque meter in the cassette housing and confirm that the back tension meets the specifications.

(6) If not, adjust it again with the IN/+SHIFT (UP) or OUT/−SHIFT (DOWN) button.

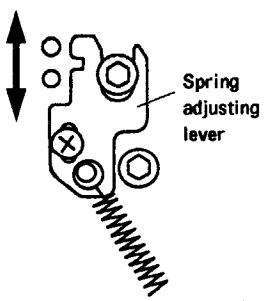
The following adjustments must be conducted when the spring of the tension arm is replaced.</td></tr>
<tr><td></td><td></td><td>TP22 :14D (MCTL/ SERVO)</td><td>Spring adjust lever</td><td>—</td><td>PB</td><td>(7) Make sure that the voltage at TP22 is 1.75 to 1.95 V_{DC}. (PB mode)

(8) If not, loosen the screw retaining the spring adjusting lever for the following adjustment.
① When voltage at TP22 is above 1.95 V_{DC}.
Fine adjust the spring adjust lever with an ordinary screwdriver so as to move it slightly rearward.
② When voltage at TP22 is under 1.75 V_{DC}.
Fine adjust the spring adjust lever with an ordinary screwdriver so as to move it slightly frontward.

(9) Check the above steps (5), (6) and (7), and repeat the above adjustments until back tension meets the specific value.</td></tr>
</table>

MODEL	BACK TENSION
BR-S800	58±3 g-cm
BR-S500	63±3 g-cm

Table2-5-1 Table of back tension

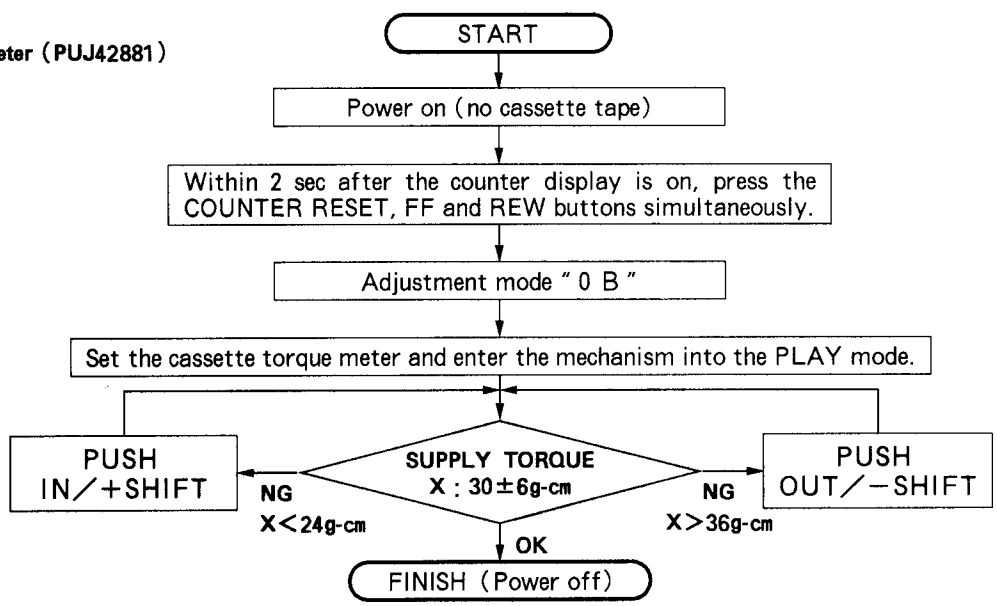


4 Loading torque

Adjust loading torque according to the following procedure.

Required instrument

- **Cassette torque meter (PUJ42881)**



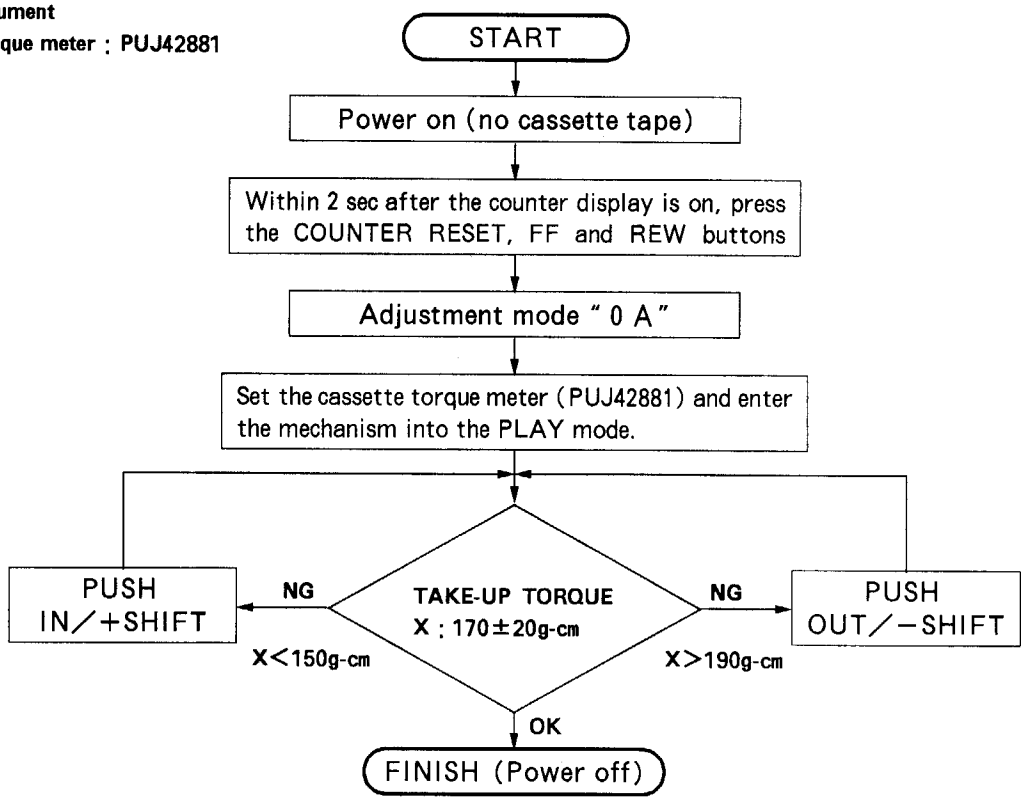
No.	Item	Check point	Adjustment parts	Signal	Mode	Adjustment and Check

5 **Take-up torque**

Adjust Take-up torque according to the following procedure.

Required instrument

- **Cassette torque meter : PUJ42881**

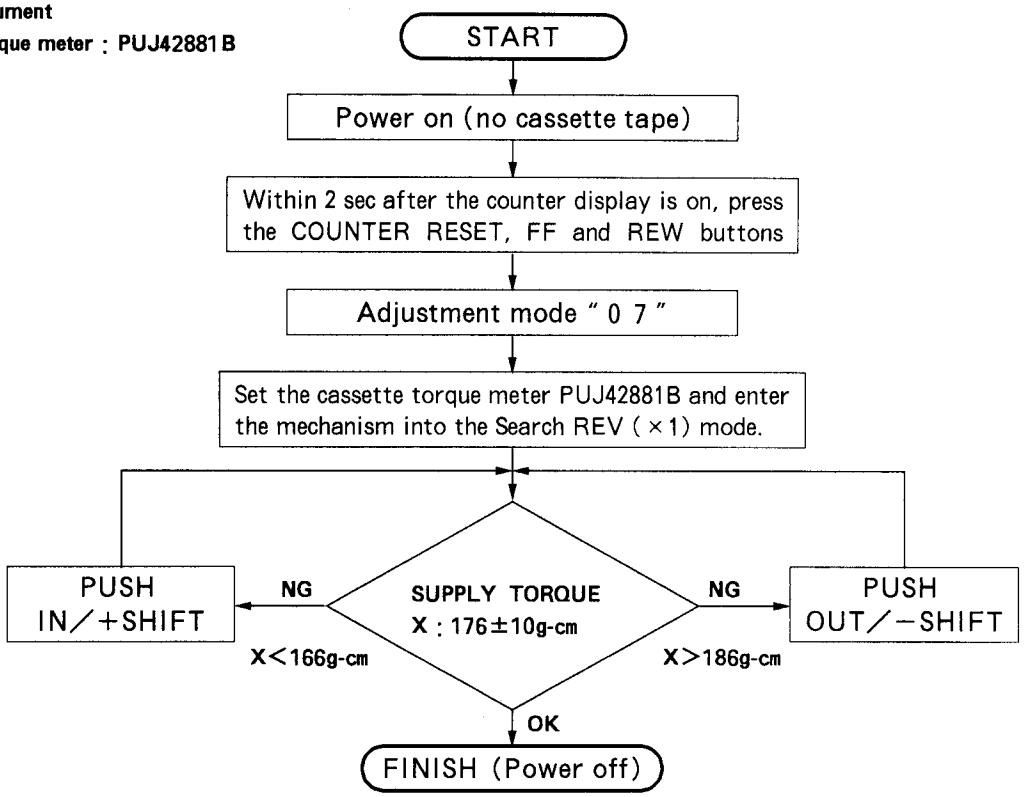


6 **Reverse (×1 speed) torque**

Adjust reverse torque according to the following procedure.

Required instrument

- **Cassette torque meter : PUJ42881B**



2.6 ADJUSTMENT OF INTERCHANGEABILITY

No.	Item	Adjustment & Check
When the upper drum assembly, drum assembly, or A/C head assembly is replaced, adjustment of the interchangeability must be conducted.		
1	**Names and locations of main parts**	

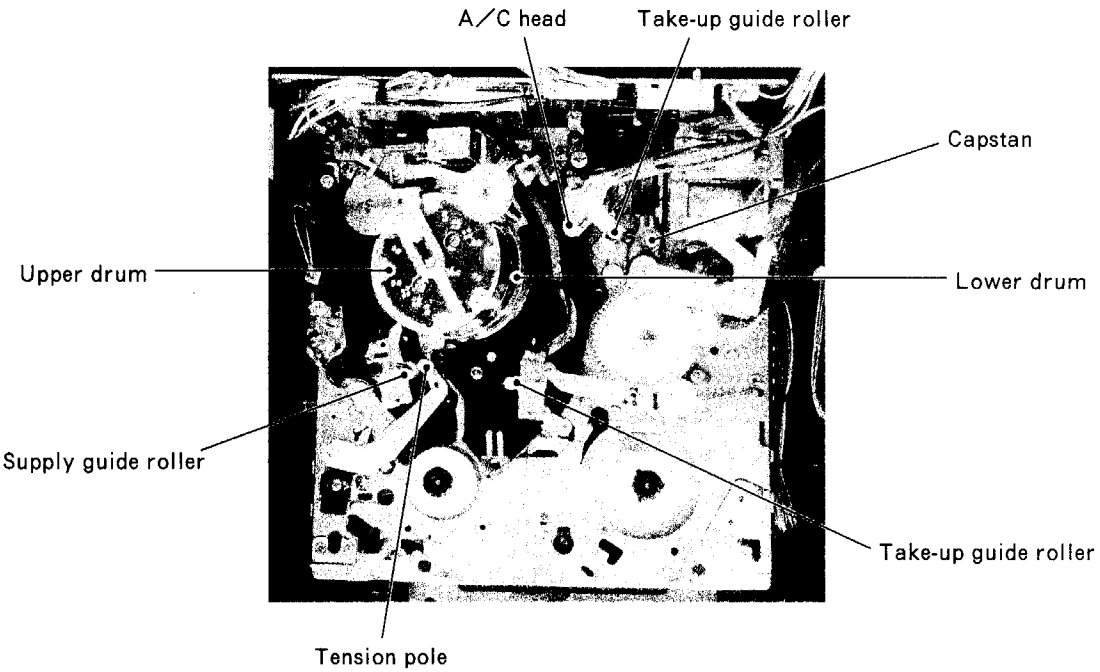


Fig.2-6-1 Names and locations of main parts

2	**Check of FM waveform**	

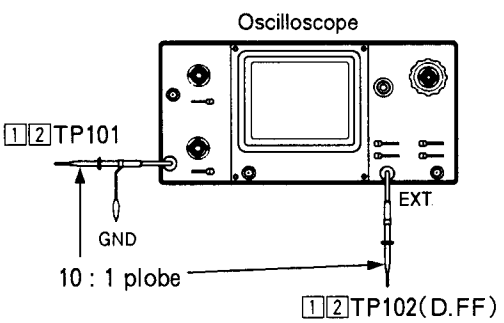


Fig.2-6-2 Connection of oscilloscope

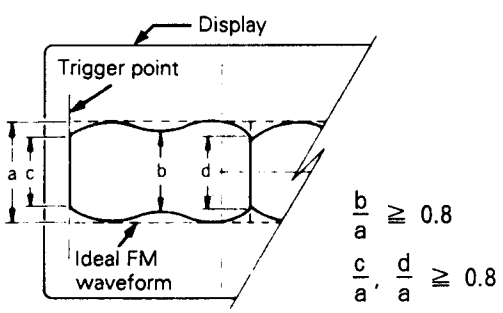


Fig.2-6-3 FM waveform

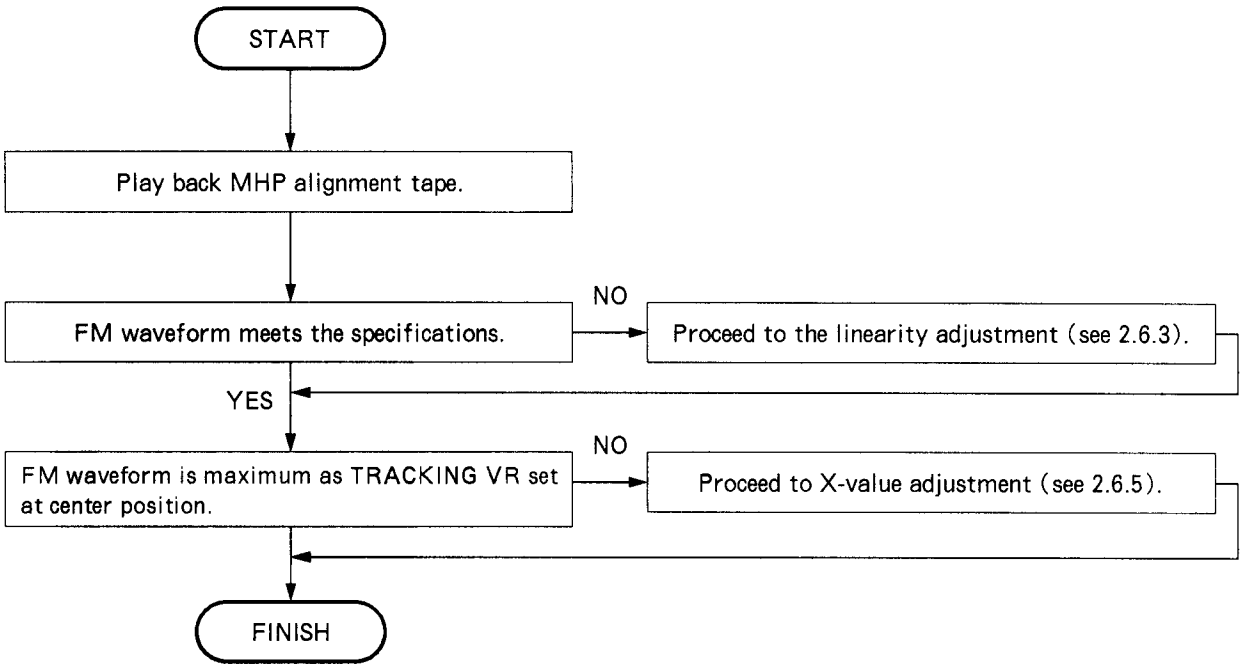
Note:
Before loading the alignment tape, load a general recording tape and check that there is no trouble with tape transport.

(1) Connect the oscilloscope to TP101(:8F) on the 1 2 AV PRE/REC board and trigger it externally with the signal of TP102(:7G) on the same board, and observe the waveform on the + slope.

(2) Play back the MHP alignment tape while maximizing the FM waveform with the TRACKING VR. As the maximum level is regarded as "a", confirm that respective levels meet the specifications as expressed by the equations.

(3) When the maximum level "a" is set for 4 scale divisions on the oscilloscope screen, levels "b", "c" and "d" must be equivalent to 3.2 scale divisions.

(4) To set the maximum level "a" for 4 scale divisions, adjust the GAIN control of the oscilloscope as the TRACKING VR is set at the maximum position.

No.	Item	Adjustment & Check
		
3	**Interchangeability adjustment** **— Linearity adjustment —**	(1) Cautions on adjustment • For linearity adjustment, play back the MHP alignment tape. • If FM dropout still continues after adjustment of the guide roller, the drum assembly needs replacement (in the case the CH1 and CH2 waveforms show the same tendency). • An FM waveform with worn-out lower drum is shown in the section (2.3.5) of the drum assembly replacement. • Required tools: • Hex driver : PGJ04034 (2mm) • Line Head wrench : PGJ04033

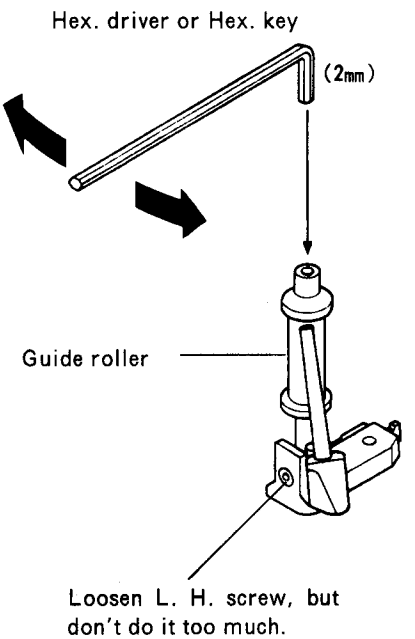


Fig.2-6-4 Guide roller height

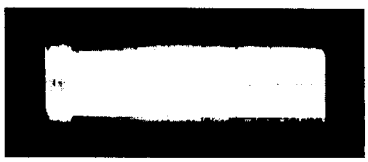
No.	Item	Adjustment & Check

MHP

Observe FM waveform.

Turn the TRACKING VR to observe waveform breaking with ease.

Turn the guide roller to flatten the waveform.



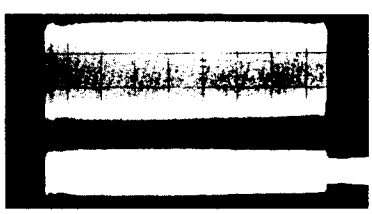
Decline the waveform output to 2/3 of the maximum level with the TRACKING VR.

Turn the guide roller counterclockwise to raise the waveform by the both ends.

Gradually lower the guide roller and stop it just before the waveform is flattened in the both ends.

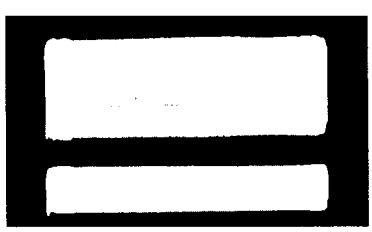
General recording tape.

Record the stairstep signal and play it back while observing the FM waveform.



Change the waveform output with the TRACKING VR while confirming that there is no change in the linearity of the waveform.

NG



OK

Tighten the L.H. screw in the lower part of the guide roller.

Proceed to the X-value adjustment.

No.	Item	Adjustment & Check
4	**Adjustment of A/C head** **If the A/C head is incorrectly positioned, it causes dropdown of audio output or deterioration in its S-to-N ratio, or misaligned servo resulting from failure in picking up control signals in the worst case when a recorded tape is playback.**	

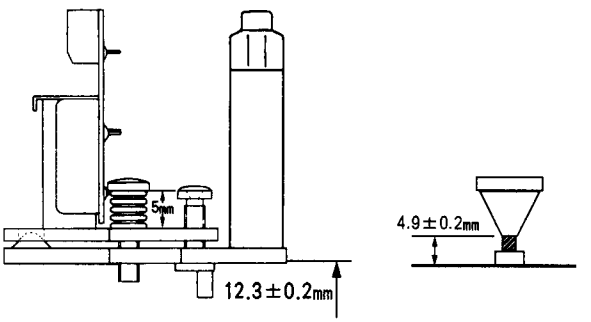


Fig.2-6-5 Adjustment of A/C head height

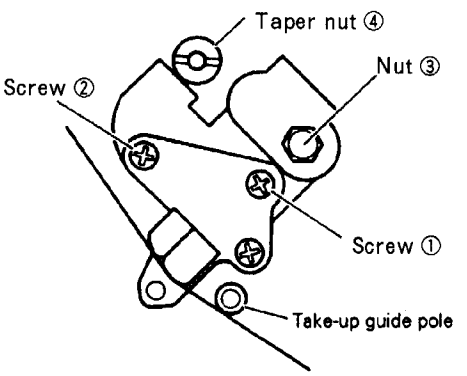


Fig.2-6-6 A/C head

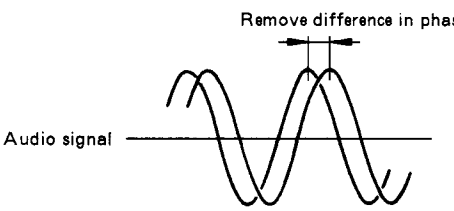


Fig.2-6-7 Azimuth

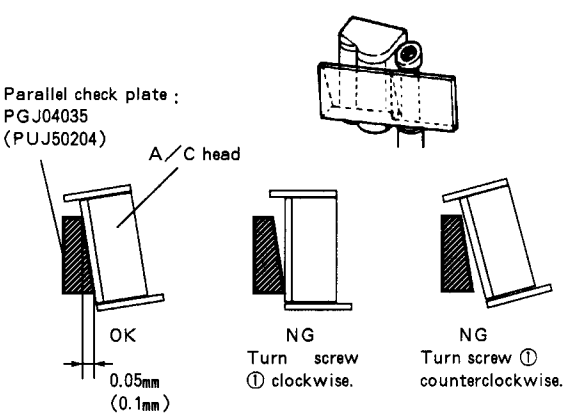


Fig.2-6-8 Parallel check

(1) **Required jig**
- Nut driver : 5.5mm
- Alignment tapes : MBA-3,MHP,MBA
- Parallel check plates : PGJ04035(0.05), PUJ50204(0.1)

(2) **Temporary check of A/C head height**

① In the stage of tape transport check preparatory to A/C head adjustment, temporarily adjust the A/C head height to prevent the tape from getting damaged as well as to conduct the adjustment with ease.

(3) **Tilt (forward bent) adjustment**

① Adjust the setscrew ① so that the A/C head closely contacts the parallel check plate surface with a tilt equivalent to 0.05mm on the base line of the plate. If there is a space between them in the upper part, the tilt is small. In that event, tighten the setscrew ① to tilt the A/C head much more. On the other hand, if there is a space in the lower part, loosen the setscrew ① to decrease the A/C head in tilt.

② Check that the tape is not damaged and wrinkled at the lower flange of the take-up guide pole. If so, fine adjust the height of the take-up guide pole.

(4) **Head height and azimuth adjustment**

① Connect CH1 of the oscilloscope with TP1 on the N. AUDIO board while CH2 with the TP2 on the same board, and set the oscilloscope to the chop mode.
Play back the MBA-3 alignment tape while adjusting the

② A/C head height by turning the hex. nut ③ so as to minimize both output levels of CH1 and CH2. (Height adjustment)

③ Play back the MHP alignment tape while adjusting the setscrew ② to match output waveforms of CH1 and CH2 in the phase as well as to maximize output level of both the channels. (Azimuth adjustment)

④ Repeat the steps (2) and (3) alternately for finer adjustment.

(5) **Azimuth check**

① Connect CH1 of the oscilloscope with TP1 on the N. AUDIO board while CH2 with TP2 on the same board, and set the oscilloscope to the chop mode.

② Play back the MBA alignment tape while confirming that there is no phase difference (less than 0.1msec) in the output waveforms of CH1 and CH2. If there is a phase difference more than 0.1msec, repeat the height and azimuth adjustment (4) above.

(6) **A/C head parallel check**

① With the parallel check plate (PUJ50204), make sure that the tilt of the A/C head is less than 0.1mm on the base line of the check plate.

② If not, repeat the above adjustments (3) through (6) until a satisfactory result is obtained.

Test points on N. AUDIO board with addresses

	BR-S800	BR-S500
TP1	6E	4A
TP2	11E	7A

No.	Item	Adjustment & Check
5	**X-value adjustment** **If the X-value is maladjusted, it results in time lag between picture and normal sound when playing back a tape recorded by a set whose X-value is correctly adjusted.**	

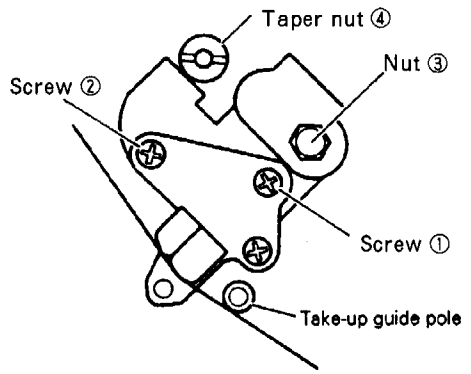


Fig.2-6-9 A/C head

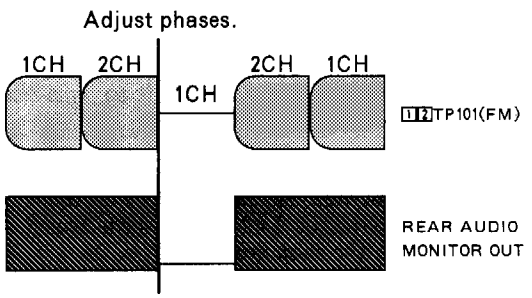
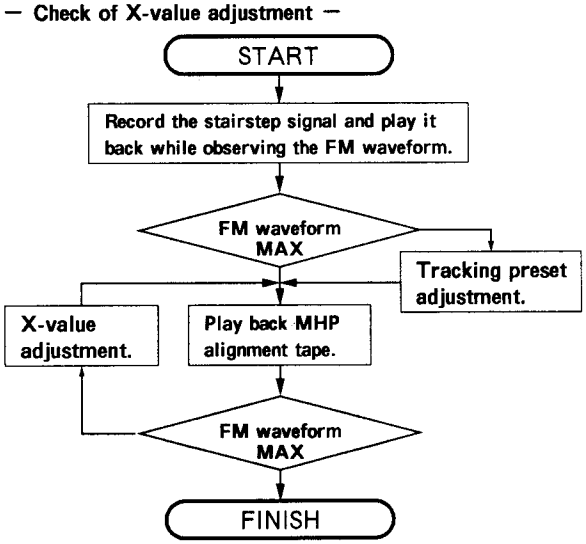


Fig.2-6-10 X-value adjustment

• Synchronization of oscilloscope

① Set the oscilloscope's sweep time to 10msec.
② In the condition being synchronized with D. FF signal, turn the oscilloscope's HOLD OFF knob in the ⊕ direction to stabilize non-recorded portion.
③ Use the oscilloscope probe of the 10:1 ratio.

— Check of X-value adjustment —



(1) **Required jig**
- Ordinary screwdriver (⊖)
- Alignment tapes : MBP-X, MHP

(2) **X-value adjustment**

① Connect CH1 of the oscilloscope with TP101(:8F) on the 1 2 AV PRE/REC board while connect CH2 with the AUDIO MONITOR terminal on the rear panel. Set the AUDIO MONITOR switch on the front panel to the NORM AUD-1/L position.

② Trigger the oscilloscope externally with signal of TP102(:7G) on the 1 2 AV PRE/REC board.

③ Play back a self-recorded tape while confirming that the FM waveform is maximum with the TRACKING VR set to the center position. If not, check to see if the tracking is correctly adjusted .
Note :
If not, fine adjust the tracking preset explained in the previous item, step (3).

④ Set the TRACKING VR to the center position.

⑤ Play back the MBP-X alignment tape.

⑥ Adjust the taper nut ④ to maximize the FM output as well as to match the non-recorded portions of AUDIO and FM outputs in the phase (field).

⑦ Play back the MHP alignment tape while confirming that the FM waveform is maximum with the TRACKING VR set to the center position.

⑧ If the result of the above step ⑦ is unsatisfactory, slide the A/C head to a point where the FM waveform is maximum near the point set in the above step ⑥.

⑨ Play back the MHP alignment tape while confirming that the FM waveform is maximum with the TRACKING VR set to the center position.

(3) **Tracking preset adjustment**

① As the set is in the Eject mode, turn off the power switch.

② Turn on the power switch again, and press the EJECT and STOP buttons simultaneously within 2 sec after the counter indicator is on.

③ When "OPEn" appears in the counter display, press the IN/+SHIFT button 8 times, and then "Tr-Adj" will appear in the counter display.

④ Set the TRACKING VR to the center click position.

⑤ Press the SET button to set adjustment data.

⑥ Press the IN/+SHIFT button repeatedly until "OPEn" appears in the counter display.

⑦ Press the MENU button.

2.7 ADJUSTMENT OF TAPE TRANSPORT SYSTEM

No.	Item	Adjustment & Check
	Generally, the tape transport system has no need of adjustment since it has precisely been adjusted before the set is shipped from factory. **However, it needs check and adjustment after long time use and parts replacement of the tape transport system.**	
1	**Check of tape transport system**	(1) **Required implements** **• Tin tape : ST-180** (2) Load a thin tape, and conduct the following checks at the beginning and end portions of the tape. (3) Repeat loading and unloading operations while confirming that the tape is neither damaged nor wrinkled at the take-up guide roller, guide pole, guide arm roller. (4) Do the same check in the Play, FWD and REV modes, respectively.

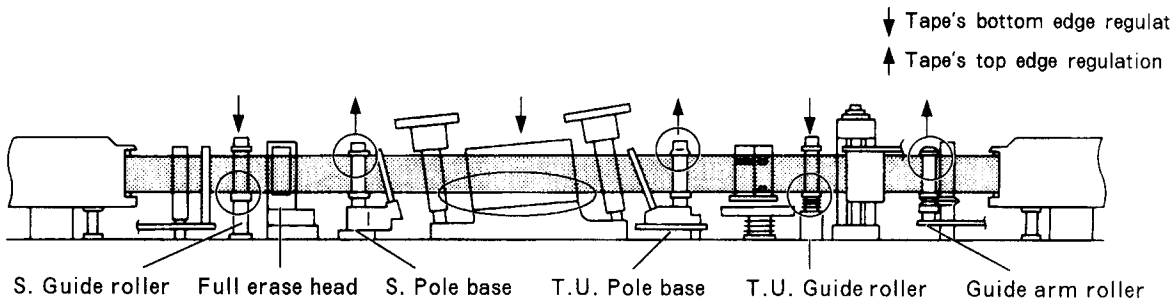


Fig.2-7-1 Check of tape transport

2	**Supply guide roller height adjustment**	(1) **Required implements** **• Height gauge : PGJ04032** **• Hex. driver : PGJ04034** **• Hex. key : 1.27mm** **• Thin tape : ST-180** (2) Set the height gauge on the main deck, and check the height of the upper surface of the lower flange of the guide roller. (3) If it needs adjustment, loosen the setscrew under the guide roller and then adjust the guide pole with a hex. driver. (4) Forwarding a thin tape in the Play mode, fine adjust the height of the guide roller so that the tape smoothly travels on the upper side of the lower flange of the guide roller. (5) Next, transport the tape in the REV mode while confirming the tape getting no damage. If the tape is damaged, decrease the height of the guide pole by turning the setscrew within a turn from the position that is set in the above step (3). (6) Tighten the setscrew. (7) Again check the tape running smoothly.

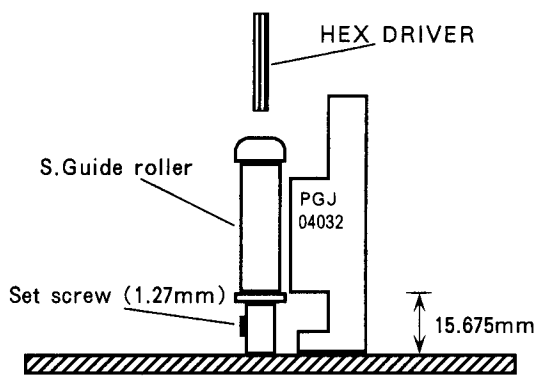


Fig.2-7-2 Supply guide roller height

No.	Item	Adjustment & Check
3	**Take-up guide roller height adjustment**	(1) **Required implements** • **Height gauge** : **PGJ04032** • **Thin tape** : **ST-180** (2) Set the height gauge on the main deck and check the height of the upper surface of the lower flange of the guide roller. (3) If it needs adjustment, adjust the height of the guide roller by turning the setscrew on the top of the guide roller. (4) Transporting a thin tape in the Play, Search FWD and Play modes in this order, check and adjust the height of the guide roller so that the tape is not wrinkled nor damaged at the lower flange of the guide roller. However, do not turn the setscrew more than 3/4 turn from the position that is set in the step (3). (5) Again check the tape running smoothly.
4	**Guide arm roller height adjustment**	(1) **Required implements** • **Height gauge** : **PGJ04032** • **Hex. driver** : **PGJ04034** • **Hex. key** : **0.9mm** • **Thin tape** : **ST-180** (2) Turn off the power. (3) As shown in the dotted circle, set the height gauge on the main deck's cutout neighboring the capstan motor in the right side. (4) Turn the loading motor counterclockwise by hand while checking the height of the lower surface of the upper flange of the guide arm roller. (5) If adjustment is needed, turn the setscrew on the top of the guide arm roller to adjust its height. (6) Transporting a thin tape in the FWD and REV modes, check that there is no change in the tape transport level at the lower flange of the take-up guide roller even when the mode is changed between the FWD and REV. (See Fig. 2-7-4.) (7) If the tape is damaged or wrinkled, repeat the above steps (2) through (6) until that smooth tape transport is confirmed.

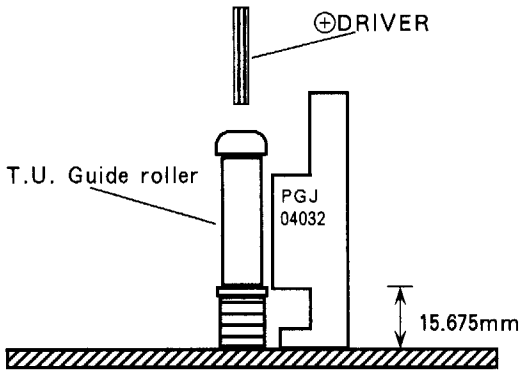


Fig.2-7-3 Ttake-up guide roller height

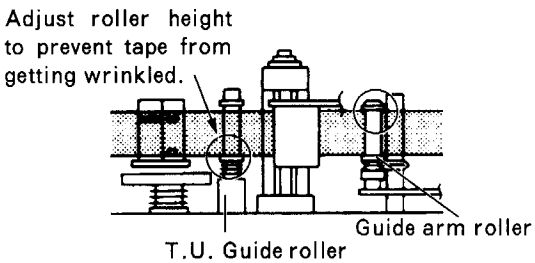


Fig.2-7-4 Tape transport check

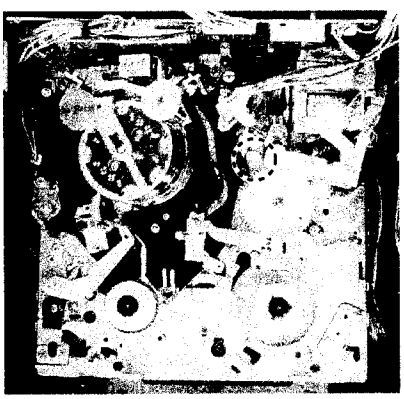


Fig.2-7-5 Main deck (top view)

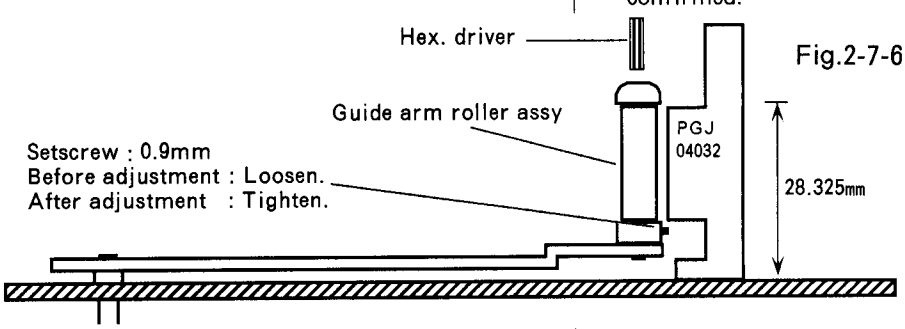


Fig.2-7-6 Guide arm roller height

SECTION 3
ELECTRICAL ADJUSTMENT

3. 1 PRECAUTIONS

Before proceeding to any electrical adjustment, it is the first prerequisite to confirm that the objective item is out of order or of breakdown. Moreover, for parts and items that need correct mechanical adjustment prior to electrical adjustment, begin by confirming that they are exactly mechanically adjusted.
Make sure to start electrical adjustment 5 or more minutes after the power is turned on.
Before starting any adjustment, make sure to reset the MENU switch to the initial setting that was set at shipment. (See Section 7.) Then, if there is a direction to set the MENU switch specially for the adjustment item in the head of a page or the beginning of an adjustment item, change the setting of the MENU switch according to the direction.

3.1.1 Required tools and test instruments

- Frequency counter (sensitivity range between 10MHz or more and 100mV or less)
- Video signal generator (TG-7/1, Model 1410, PGJ05003, or equivalent)
- Waveform monitor (1485R, or equivalent)
- Digital voltmeter (available for 1 mV DC or under)
- Sweep signal generator (100kHz to 10MHz, Model-430*1, or equivalent)
- Oscilloscope (dual-trace type, available for 50MHz or more)
  Use an oscilloscope probe of 10:1 ratio unless otherwise specified.
- Vectorscope (520A, or equivalent)
- TV monitor
- Audio tester

1 :VC-G30U/VC-G40U cable (optional) to supply Y/C443 output of the Model-430P to this set.

Besides the above-mentioned instruments, the following special instruments are needed.

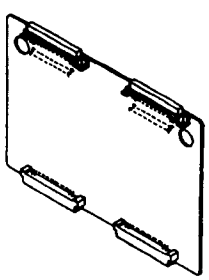
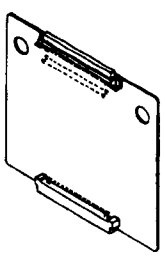
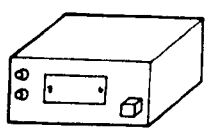
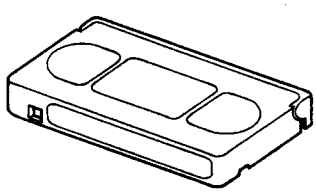
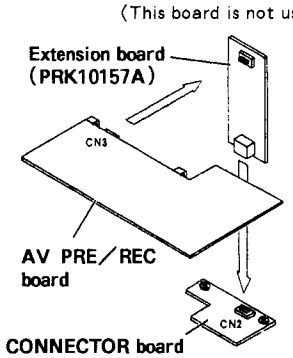
Extension boards		Carrier checker
1. PGJ05043 for VIDEO-1, VIDEO-2, FM AUDIO, NORMAL AUDIO, AV I/O boards 	2. PGJ05006 for SYSCON board 	PGJ05008 
Alignment tape	**Extension boards**	
3-2ページ参照 	PRK10157A5 for AV PRE/REC board (This board is not used for adjustment.)  Due to the poor conductivity of GND, picture becomes too noisy to recognize during recording and play back. When this board is used for troubleshooting of the play back system, make sure to connect the bracket of the AV PRE/REC board and the main-deck with a thick shorting wire (braided wire) for grounding.	

Fig.3-1-1 Required special implements

3.1.2 Specification of alignment tapes

•MHP

Video signal	N. Audio signal	Application	Remark
VHS (SP mode) Stairstep	7kHz	•For check and adjustment of interchangeability. •For adjustment of PB switching point.	MH-1 stairstep signal is substitutable.

•MHV-2

Video signal	Audio signal	Application	Remark
VHS (SP mode) Color bar	–	•For check and adjustment of video PB circuit.	MH-1 color bars signal is substitutable.

•MBA(MHA)

Video signal	N. Audio signal	Application	Remark
CTL signal only	1kHz(0dB)	•For check and adjustment of audio PB circuit.	MH-1 1 kHz signal is substitutable.

•MH-6

No.	Play-Back time	Video signal	N. Audio signal	Application
1	2 minutes	Color sweep	400Hz(−20dB)	•For check and adjustment of frequency response of video PB circuit. •For check and adjustment of frequency response of audio PB circuit.
2	2 minutes	Color sweep	100Hz(−20dB)	
3	2 minutes	Color sweep	10kHz(−20dB)	
4	4 minutes	Color sweep	–	

•MH-F6

No.	Play-Back time	Video signal	FM Audio signal	Application
1	5 minutes	–	Carrier only	For check and adjustment of interchangeability of mechanism.
2	5 minutes	Stairstep	Carrier only	
3	5 minutes	–	1kHz (±50kHz DEV)	For check and adjustment of FM audio PB circuit.

•MHV-2H

Video signal	Audio signal	Application	Remark
S-VHS (SP mode) Color bar	–	•For check and adjustment of video PB circuit.	MH-1H SP mode color bar signal is substitutable.

•MBV-3H

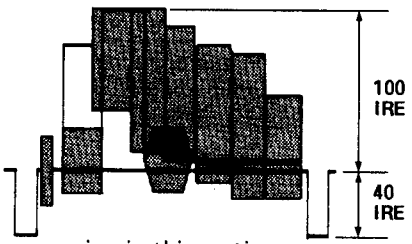
Video signal	Audio signal	Application	Remark
S-VHS (SP mode) Sweep signal	–	•For check and adjustment of video frequency response.	MHV-3H is renamed.

•MBAF-3

Video signal	FM Audio signal	Application	Remark
Carrier only (4MHz)	1KHz (±50KHz DEV)	•For check and adjustment of FM audio PB circuit.	–

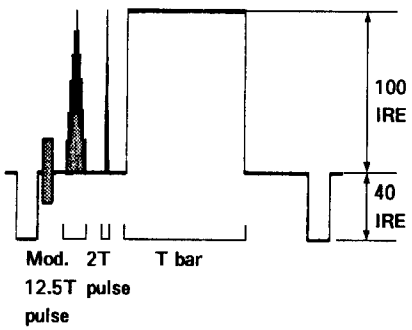
3.1.3 Signals required for video system adjustment

(1) EIA Color bar signal (75%, setup at 7.5%)

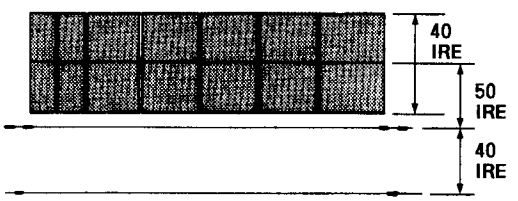


All color levels appearing in this section are measured or to be measured with this color bars signal.
If another color bars signal such as of 100 % color level is used, it brings on different measurement results.

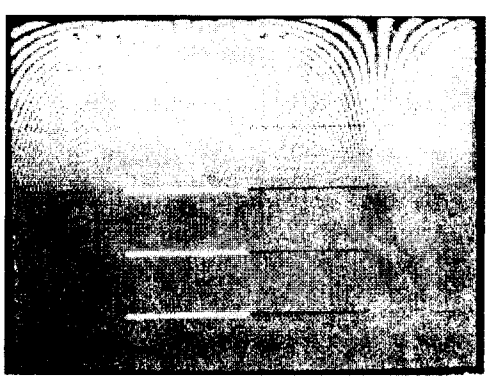
(2) Pulse & bar signal



(3) Video sweep signal (100k to 5MHz)



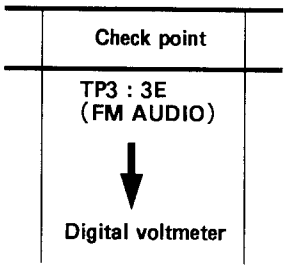
To input this signal through the LINE IN terminal, make sure to use a sweep signal well-balanced in H. correlation in order to avoid malfunction of the comb filters.
For a reference, a sweep signal having a good H. correlation shows such a clear pattern as neighboring black and white lines are the same in the width and interval on the monitor screen as shown in the figure below.



(4) Multi-burst signal

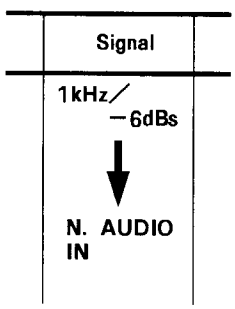
3.1.4 Explanation of main columns in check and adjustment table.

(1) "Check Point" column



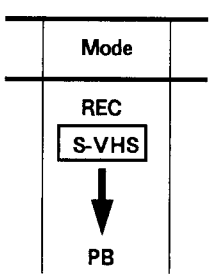
The Check Point column indicates measuring instruments to be used and test points to connect measuring instruments (use and connection of oscilloscope are omitted).
Symbol (consisting of numeral and alphabet) following the symbol of a test point and colon indicates a section of the specified board where the test point is located.
In case of the above sample, TP3 is located in the section 3E of the FM AUDIO board, and TP3 should be connected with a digital voltmeter.
When a terminal on the rear board is indicated in the Check Point column, connect a measuring instrument directly to the terminal.

(2) "Signal" column



The Signal column indicates signals to input and terminals to input the signal. (When no input terminal is indicated, input signal through the LINE IN terminal.)
Note:
When the Y/C358 terminal is specified as an input terminal, set the VIDEO INPUT switch on the front panel to the Y/C358 position.
In case of the above sample, input a 1kHz, −6dBs signal through the NORMAL AUDIO INPUT terminal.
When adjustment requires to play back an alignment tape to supply input signal, the part number of a required alignment tape is indicated in this column.

(3) "Mode" column



The Mode column specifies the modes that the set must enter for undergoing the adjustment.
In case the mode is specified as shown in the left for example, perform the adjustment by playing back a tape that was recorded in the S-VHS mode.
" × × " (number) appearing in the Mode column expresses the number of the automatic adjustment mode.
When " × × " is appearing in the Mode column, activate the automatic adjustment mode by the specified number (" × × ") and proceed to the adjustment following the instruction. (For detail of the automatic adjustment, refer to the Section 7.5)

3. 2 SERVO CIRCUIT

• *The test point of D-F.F. output is TP102(:7G) on the [1][2] AV PRE/REC board.*

No.	Item	Check point	Adjustment	Signal	Mode	Check and Adjustment
1	**Duty factors of FG pulses & Stop servo (automatic adjustment)**	–	–	–	Adjust mode "0 4"	(1) After turning on the power (within 2 sec), press the FF, REW and COUNTER RESET buttons simultaneously to enter the set into adjustment mode. (2) Press the MENU (+) or SET (−) button to set for the adjustment mode No. "04". (3) Press the +SHIFT or −SHIFT button and the reel motor, capstan motor and drum motor take turns at rotating to perform automatic adjustment. (4) With completion of the automatic adjustment, every motor stops and "End" appears in the counter display.
2	**Switching point**	TRACKING METER	TRACKING VR	MHP	Adjust mode "0 F"	(1) After turning on the power (within 2 sec), press the FF, REW and COUNTER RESET buttons simultaneously to enter the set into adjustment mode. (2) Press the MENU (+) or SET (−) button to set for the adjustment mode No. "0F". (3) Play back the MHP alignment tape while adjusting the TRACKING VR so that the TRACKING METER reads the signal level to the maximum. (4) Press the +SHIFT or −SHIFT button and automatic adjustment starts. (5) With completion of the automatic adjustment, every motor stops and "End" appears in the counter display.
3	**EP Tracking**	TP101 : 8F (AV PRE/REC)	TRACKING VR	MHP-L	Adjust mode "1 0"	(1) After turning on the power (within 2 sec), press the FF, REW and COUNTER RESET buttons simultaneously to enter the set into adjustment mode. (2) Press the MENU (+) or SET (−) button to set for the adjustment mode No. "10". (3) Play back the MHP-L alignment tape. (4) Press the +SHIFT or −SHIFT button and automatic adjustment starts. (5) With the MHP-L tape being played, adjust the TRACKING VR to maximize signal level at TP101 (FM waveform). ***Note:*** ***Trigger the oscilloscope with a signal of TP102(:7G) on the AV PRE/REC board. (⊕ SLOPE)*** (6) Press the AUTO MODE switch and the resultant data is set in the memory.

3. 3 AUDIO CIRCUIT

3.3.1 Manual adjustment

- *For adjustment of the audio circuit, select "OFF(0)" for setting the "LIMITER" of the MENU switch No. 202.*

No.	Item	Check point	Adjustment	Signal	Mode	Check and Adjustment
1	**Hi-Fi audio carrier frequency**	TP1 : 7A (FM AUDIO) ↓ Frequency counter	VR57 : 7A (FM AUDIO)	No signal input	REC VHS	(1) Set the MENU switch No. 200 to "ON" position. (2) Adjust VR57 to obtain 1.300 MHz as the frequency of TP1 signal.
		L-ch carrier frequency : 1.300±0.002MHz				
		TP2 : 7A (FM AUDIO) ↓ Frequency counter	VR58 : 8A (FM AUDIO)	No signal input	REC VHS	(3) Adjust VR58 to obtain 1.700 MHz as the frequency of TP2 signal.
		R-ch carrier frequency : 1.700±0.002MHz				
2	**Conduct automatic adjustment of the AUDIO circuit. (See the following page for detail.)** **To conduct automatic adjustment of the audio circuit, proceed as follows.** **• After turning on the power (within 2 sec), press the FF, REW and COUNTER RESET buttons at the same time.** **• "00 00" appears in the counter display.** **• Insert a required tape.** **• Press the MENU (+) or SET (−) button to select an automatic adjustment mode by number.** **• Press the COUNTER RESET button and automatic adjustment starts with indication of "P" in the counter display.** **• As the automatic adjustment finishes, the tape is automatically ejected and "End" appears in the counter display.** ***Note : When "Error" is displayed, no adjustment is performed and the previous adjustment data is recovered.***					
3	**Hi-Fi AUDIO LEVEL METER**	HiFi AUDIO OUT (600Ω terminator) ↓ Audio level meter	R107 : 10G (Lch) R108 : 9G (Rch) (AV I/O)	1kHz/ −6dBs ↓ HiFi AUDIO IN	E-E	(1) With the HiFi REC LEVEL VR adjust the output from the HiFi AUDIO output terminal to be −6.0 (±0.3)dBs. (2) Set the AUDIO MONITOR switch to the HiFi position. (3) Set the METER SELECT switch to the AUD-2 position. (4) Adjust R107 (for L-ch) and R108 (for R-ch) so that the AUDIO LEVEL METER reads 0.0dB as viewed from the right front. ***Note:*** ***For adjusting the BR-S500 in this item, play back the alignment tape MBAF-3 or the 1kHz segment of MH-F6 tape.***

3.3.2 Automatic adjustment

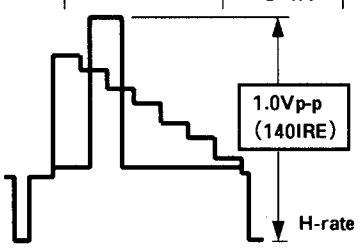
No.	Item	Check point	Adjust-ment	Tape "A"	Mode "B"	Check and Adjustment
1	**Normal Audio PB level**	–	–	MBA	Adjust mode "1 8"	(1) After turning on the power (within 2 sec), press the FF, REW and COUNTER RESET buttons simultaneously to enter the set into adjustment mode. (2) Load the set with the specified tape and press the MENU (+) or SET (−) button to select the adjustment mode No."B". (3) Press the COUNTER RESET button and automatic adjustment starts with indication of "P" in the counter display. (4) With completion of the automatic adjustment, the tape is automatically ejected and "End" appears in the counter display.
2	**Normal Audio PB frequency response**	–	–	MH-6	Adjust mode "1 9"	
3	**Hi-Fi Audio PB level**	–	–	MH-F6 (1kHz) or MBAF-3	Adjust mode "1 A"	
4*	**BR-S800 Normal Audio REC/PB level**	–	–	S-VHS DC	Adjust mode "1 B" [S-VHS]	(1) After turning on the power (within 2 sec), press the FF, REW and COUNTER RESET buttons simultaneously to enter the set into adjustment mode. (2) Load the set with an S-VHS cassette tape and press the MENU (+) or SET (−) button to select the adjustment mode No."1B". (3) Press the COUNTER RESET button. (4) With completion of the automatic adjustment, the tape is automatically ejected and "End" appears in the counter display.
				VHS DC	Adjust mode "1 B" [VHS]	(5) Change the tape with a VHS cassette tape and proceed to do the same adjustment for the VHS mode as for the S-VHS mode carried out in the above steps.
5*	**BR-S800 Normal Audio frequency response (REC/PB)**	–	–	S-VHS DC	Adjust mode "1 C" [S-VHS]	(1) After turning on the power (within 2 sec), press the FF, REW and COUNTER RESET buttons simultaneously to enter the set into adjustment mode. (2) Load the set with an S-VHS cassette tape and press the MENU (+) or SET (−) button to select the adjustment mode No."1C". (3) Press the COUNTER RESET button. (4) With completion of the automatic adjustment, the tape is automatically ejected and "End" appears in the counter display.
				VHS DC	Adjust mode "1 C" [VHS]	(5) Change the tape with a VHS cassette tape and proceed to do the same adjustment for the VHS mode as for the S-VHS mode carried out in the above steps.
6*	**BR-S800 HiFi Normal Audio REC/PB level & EE level**	–	–	S-VHS DC	Adjust mode "1 D" [S-VHS]	(1) After turning on the power (within 2 sec), press the FF, REW and COUNTER RESET buttons simultaneously to enter the set into adjustment mode. (2) Load the set with an S-VHS cassette tape and press the MENU (+) or SET (−) button to select the adjustment mode No."1D". (3) Press the COUNTER RESET button. (4) With completion of the automatic adjustment, the tape is automatically ejected and "End" appears in the counter display.
				VHS DC	Adjust mode "1 D" [VHS]	(5) Change the tape with a VHS cassette tape and proceed to do the same adjustment for the VHS mode as for the S-VHS mode carried out in the above steps.

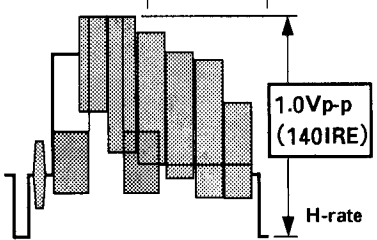
*: ***Automatic adjustments of the above items No. 4, 5, 6 are provided for the recording system of the audio circuit. Although the above description is given to individual adjustment procedures of the those items, they can undergo automatic adjustment together with when the adjustment mode No."1E" is selected. (However, adjustments for the VHS and S-VHS modes must be conducted individually.)***

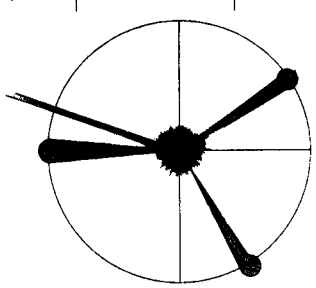
3. 4 VIDEO CIRCUIT

- ***The test point of D-F.F. output is TP102(:7G) on the [1][2] AV PRE/REC board.***
- ***For adjusting the VIDEO circuit, set the MENU switch No.101 (EDIT SELECT) to "DUB or EDIT" (1).***

No.	Item	Check point	Adjustment	Signal	Mode	Check and Adjustment
1	**VCXO**	TP4 : 11E (VIDEO-1) ⬇ Frequency counter	C89 : 12E (VIDEO-1) **TP4 : 3.579545MHz±10Hz**	MHV-2H	PB	(1) Adjust C89 to obtain 3.579545MHz as the frequency of TP4's signal.
2	**BR-S800U AGC gain level**	Y/C358 ▪Y OUT (75Ω terminator)	R11 : 5G (VIDEO-1)	Color bar ⬇ Y/C358 ▪Y IN ▪C IN	E-E	(1) Set the VIDEO INPUT switch to the Y/C358 position. (2) Adjust R11 so that output level of the Y/C358 Y OUT terminals is 1.0Vp-p (140IRE).
3	**BR-S800U COMB filter level**	VIDEO OUT (75Ω terminator)	R33 : 8G (VIDEO-1)	Color bar	E-E	(1) Adjust R33 so that output level of the VIDEO OUT terminal is 1.0Vp-p.
		VIDEO OUT (75Ω terminator) ⬇ Vectorscope	R34 : 7G (VIDEO-1)	Color bar	E-E	(2) Input color bars signal directly to the vectorscope while adjusting its GAIN control to position the burst tip at the "0dG" point in the −(B-Y) axis on the vectorscope screen. (3) Next, connect the vectorscope to the VIDEO OUT terminal and input color bars signal through the VIDEO IN terminal. (4) In the condition of (3) above, adjust R34 so that burst level is equal to the value that is obtained in the previous step (2).

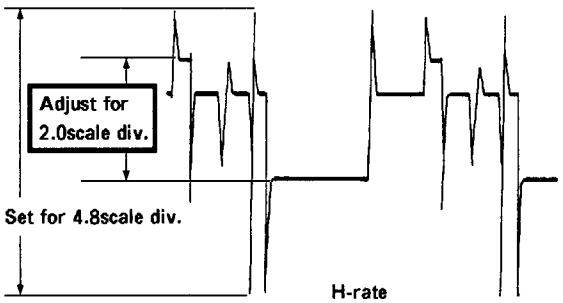
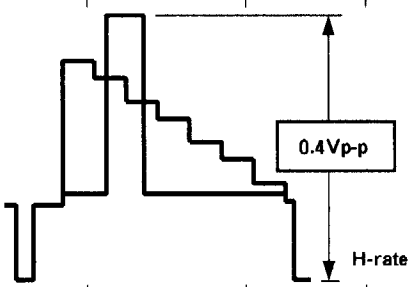
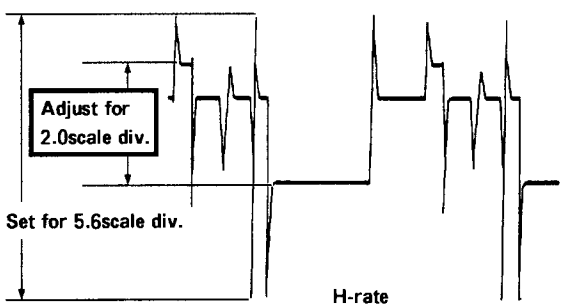
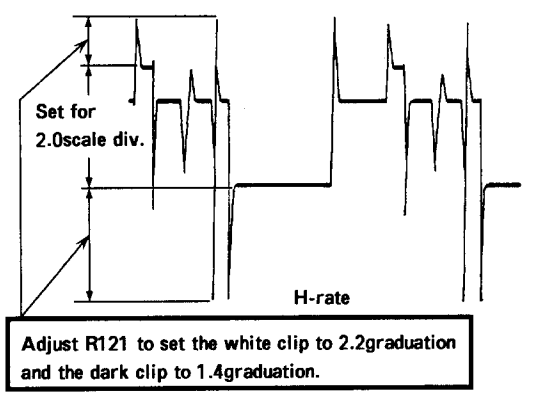






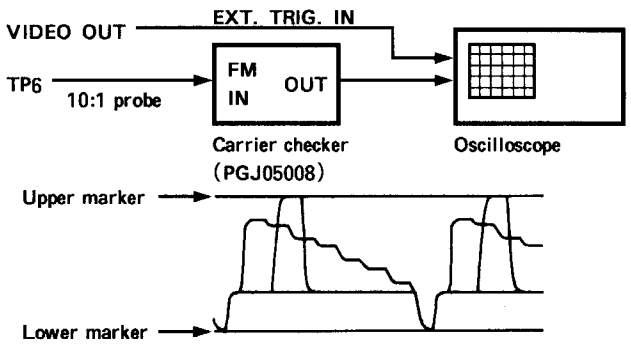
Utilizing the radius of the vectorscope screen's circumference as a ruler, equalize burst level of output of the VIDEO OUT terminal with the input signal level with

- *The test point of D-F.F. output is TP102(:7G) on the 1/2 AV PRE/REC board.*
- *For adjusting the VIDEO circuit, set the MENU switch No.101 (EDIT SELECT) to "DUB or EDIT" (1).*

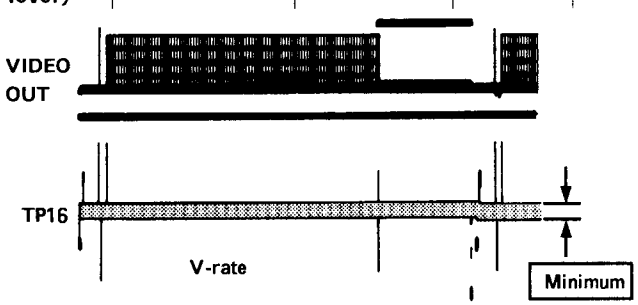
No.	Item	Check point	Adjustment	Signal	Mode	Check and Adjustment
4	**BR-S800U VHS mode White & Dark clip**	TP7 : 4E (VIDEO-2)	R146 : 2C (VIDEO-2)	Pulse & bar	E-E VHS	(1) Set the MENU switch No.100 to "VHS". (2) Adjust the oscilloscope's GAIN control to set the level difference between the white clip and the dark clip for 4.8scale divisions of the oscilloscope screen. (3) Adjust R146 so that the difference between the sync tip and the 100% white level is for 2.0scale divisions of the oscilloscope. ***Note :*** ***After the step (3), make sure that the level difference between the white clip and the dark clip is still for 5.0scale divisions.*** (4) Return the setting of the MENU switch No.100 to "AUTO".
						
5	**BR-S800U Sub emphasis input level**	TP2 : 6F (VIDEO-2)	R41 : 5G (VIDEO-2)	Color bar	E-E	(1) Adjust R41 to obtain 0.4Vp-p as the signal level at TP2.
						
6	**BR-S800U S-VHS mode White & Dark clip**	TP7 :4E (VIDEO-2)	R31 : 8F (VIDEO-2)	Pulse & bar	E-E S-VHS	(1) Adjust the oscilloscope's GAIN control to set the level difference between the white clip and the dark clip for 5.6scale divisions of the oscilloscope screen. (2) Adjust R31 so that the difference between the sync tip and the 100% white level is for 2.0scale divisions of the oscilloscope. ***Note :*** ***After the step (2), make sure that the level difference between the white clip and the dark clip is still for 5.6scale divisions.***
						
			R121 : 3F (VIDEO-2)	Pulse & bar	E-E S-VHS	(3) Adjust the oscilloscope's GAIN control to set the difference between the sync tip and the 100% white level is for 2.0scale divisions. (4) At the same time, adjust R121 to set the white clip to the graduation of 2.2 and the dark clip to the graduation of 1.4 of the oscilloscope scale.
						

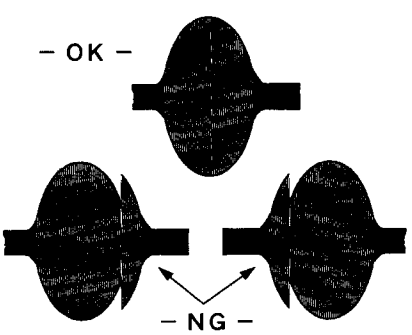
- *The test point of D-F.F. output is TP102(:7G) on the 1/2 AV PRE/REC board.*
- *For adjusting the VIDEO circuit, set the MENU switch No.101 (EDIT SELECT) to "DUB or EDIT" (1).*

No.	Item	Check point	Adjustment	Signal	Mode	Check and Adjustment
7	**BR-S800U Carrier & Deviation**	TP6 : 7D (VIDEO-2)	R124 : 3F (Carrier) R132 : 4F (Deviation) (VIDEO-2)	Color bar	E-E S-VHS	***Note :*** ***This adjustment needs the carrier checker (PGJ05008).*** (1) Make sure that the MENU switch No.100 is set to "AUTO" position. (2) Connect the carrier checker and the oscilloscope as illustrated in the left. (3) Set the carrier checker for "S-VHS" mode and the DEVI/BAL switch to "DEVI" position. (4) Adjust R124 to accord the sync tip with the lower marker while adjusting R132 to accord the 100% white level with the upper marker. ***Note :*** ***The above adjustment requires that both the sync tip and the 100% white level accord with the marker respectively.***
			R126 : 5F (Carrier) R128 : 5F (Deviation) (VIDEO-2)	Color bar	E-E VHS	(5) Set the MENU switch No.100 to "VHS". (6) In the same manner as for the S-VHS mode, accord the sync tip with the lower marker with R126 and the 100% white level with the upper marker with R128 respectively. (7) Return the MENU switch No.100 to "AUTO".
8	**YNR NC balance (DOC Y level)**	TP16 : 2D (VIDEO-2)	R12 : 15C (VIDEO-2)	Color bar	E-E S-VHS	***Note : If this item is maladjusted, white or black noise may appear during play-back of drop-out part.*** (1) Minimize the level of TP16 signal with R12. ***Note:*** ***When the BR-S500U needs this adjustment, play back the alignment tape MHV-2H since it is equipped with no INPUT terminal.***
9	320f_H VCO	TP11 : 14E (VIDEO-1)	R147 : 12E (VIDEO-1)	MHV-2H	PB	(1) Adjust R147 so that TP11's waveform becomes the same as the top (OK) figure on the left.



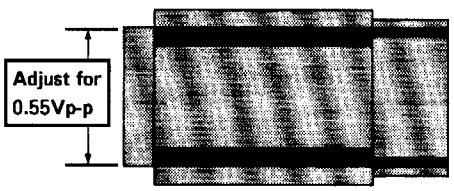
Mode	CARRIER		DEVIATION
	Sync-tip	100%White	
S-VHS	5.4MHz	7.0MHz	1.6MHz
VHS	3.4MHz	4.4MHz	1.0MHz



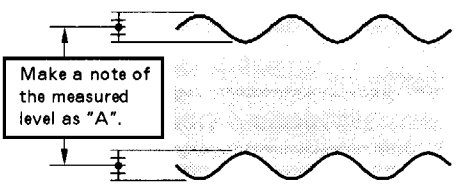


- *The test point of D-F.F. output is TP102(:7G) on the [1][2] AV PRE/REC board.*
- *For adjusting the VIDEO circuit, set the MENU switch No.101 (EDIT SELECT) to "DUB or EDIT" (1).*

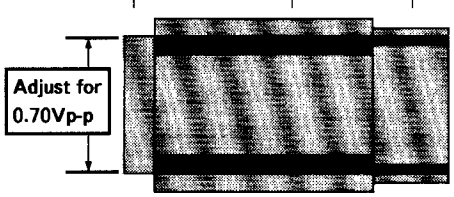
No.	Item	Check point	Adjustment	Signal	Mode	Check and Adjustment
10	**BR-S800U REC FM level**	TP6 : 7D (VIDEO-2)	R81 :7C (VIDEO-2)	Color bar	REC [VHS]	(1) Adjust R81 to obtain 0.55Vp-p as the level of TP6's FM waveform.
		TP4 : 7B (FM AUDIO)	—	MBAF-3	PB	(2) While playing back the MBAF-3 alignment tape, set the TRACKING VR to the optimum point. (3) Measure the output level (RF level) at TP4 for both channels. (Make a note of the measured level as "A".) ***Note :*** ***There is a 1kHz signal recorded on the MBAF-3 alignment tape, and its play-back waveform is observed as shown by the figure in the left.***
				Color bar (VIDEO) No input (AUDIO)	REC [VHS] ↓ PB	(4) Record the color bar signal and play it back. (5) In the same manner as the previous steps (2) and (3), measure the RF level of the FM audio signal for both channels. (6) Check to see whether the RF level of the FM audio signal is 1.2times as high as "A" measured in the step (3) or not for both channels. (7) If the level difference is less than 1.2times, readjust R81 so that the level of the FM waveform at TP6 becomes 0.5Vp-p and try to do the same steps from (2) through (6) once again.
		TP6 : 7D (VIDEO-2)	R63 : 6B (VIDEO-2)	Color bar	REC [S-VHS]	(1) Adjust R63 to obtain 0.70Vp-p as the level of TP6's FM waveform.



TRIG : D-FF
⊖SLOPE(CH1)
⊕SLOPE(CH2)



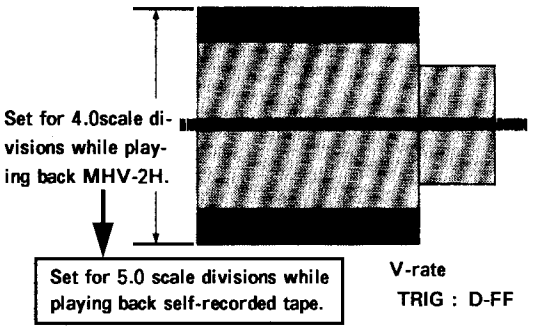
TRIG : D-FF

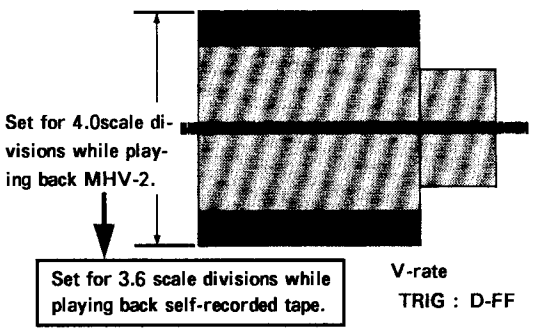


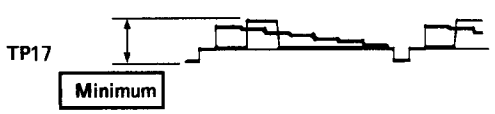
TRIG : D-FF
⊖SLOPE(CH1)
⊕SLOPE(CH2)

- *The test point of D-F.F. output is TP102(:7G) on the [1][2] AV PRE/REC board.*
- *For adjusting the VIDEO circuit, set the MENU switch No.101 (EDIT SELECT) to "DUB or EDIT" (1).*

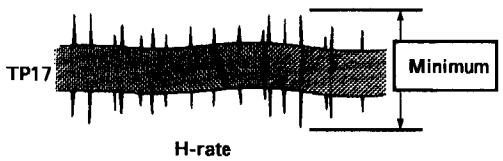
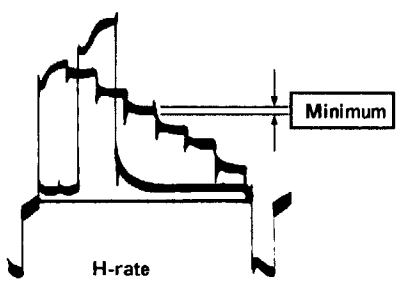
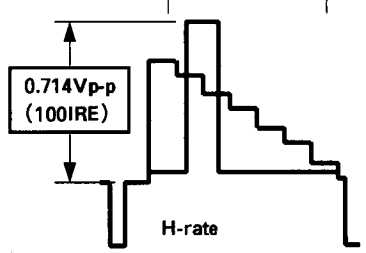
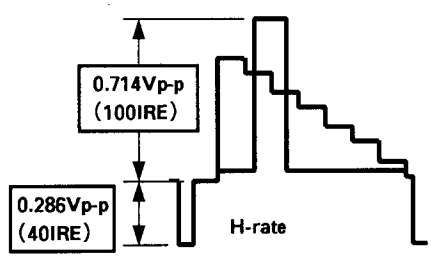
No.	Item	Check point	Adjustment	Signal	Mode	Check and Adjustment
11	**BR-S800U REC color level**	TP5 : 10B (VIDEO-2)	–	MHV-2H	PB	(1) Play back the MHV-2H alignment tape. ***Note :*** ***Set the TRACKING VR to the optimum position.*** (2) Adjust the GAIN control of the oscilloscope to set color level at TP5 for 4.0scale divisions of the oscilloscope. ***Note :*** ***If there is a difference in level between two channels, perform the adjustment basing on the level of a channel which has the higher play-back level of the color bars signal than the other.***
			R54 : 7B (VIDEO-2)	Color bar	REC [S-VHS] ↓ PB	(3) Record color bars signal and play it back. (4) Adjust R54 so that output level at TP5 becomes for 5.0scale divisions on the oscilloscope (+2.0dB to the alignment tape). ***Note :*** ***R54 should be adjusted in recording. Counterclockwise turning of R54 increases the level.***
			–	MHV-2	PB	(1) Play back the MHV-2 alignment tape. ***Note :*** ***Set the TRACKING VR to the optimum position.*** (2) Adjust the GAIN control of the oscilloscope to set color level at TP5 for 4.0scale divisions of the oscilloscope. ***Note :*** ***If there is a difference in level between two channels, perform the adjustment basing on the level of a channel which has the higher play-back level of the color bars signal than the other.***
			R72 : 8C (VIDEO-2)	Color bar	REC [VHS] ↓ PB	(3) Record color bars signal and play it back. (4) Adjust R72 so that output level at TP5 becomes for 3.6scale divisions on the oscilloscope (−1.0dB to the alignment tape). ***Note :*** ***R72 should be adjusted in recording. Counterclockwise turning of R72 increases the level.***
12	**ΔY (Non-correlated pulse)**	TP17 : 15A (VIDEO-2)	R273 : 11C (VIDEO-2)	Color bar	REC [VHS] ↓ PB	(1) Observing the waveform of TP17's signal, adjust R273 to minimize the level shown in the figure. ***Note :*** ***For adjusting the BR-S500U in this item, play back the MHV-2H alignment tape since it has no INPUT terminal.***


Set for 4.0scale divisions while playing back MHV-2H.
Set for 5.0 scale divisions while playing back self-recorded tape.
V-rate
TRIG : D-FF


Set for 4.0scale divisions while playing back MHV-2.
Set for 3.6 scale divisions while playing back self-recorded tape.
V-rate
TRIG : D-FF

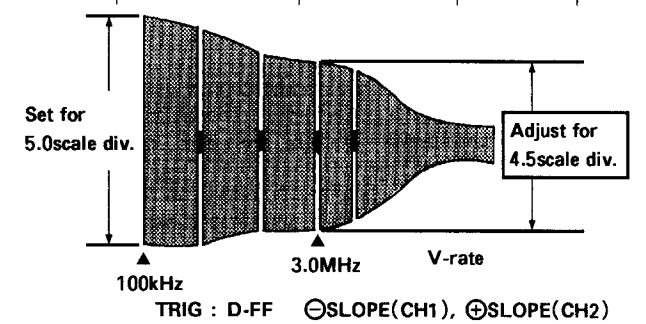


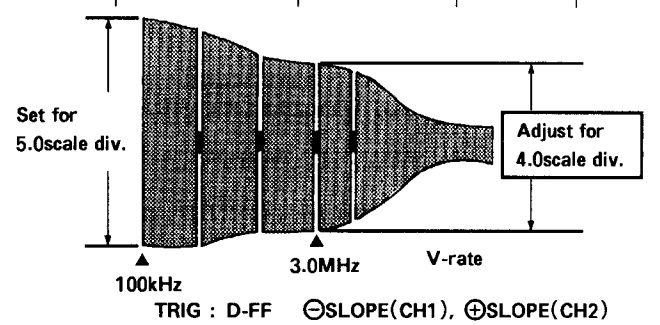
- *The test point of D-F.F. output is TP102(:7G) on the 1 2 AV PRE/REC board.*
- *For adjusting the VIDEO circuit, set the MENU switch No.101 (EDIT SELECT) to "DUB or EDIT" (1).*

No.	Item	Check point	Adjustment	Signal	Mode	Check and Adjustment
13	**PB Y COMB-1**	TP17 : 15A (VIDEO-2)	R243 : 13D (VIDEO-2)	Color bar	REC VHS ↓ PB	(1) Adjust R243 to minimize the level of TP17's signal. ***Note :*** ***For adjusting the BR-S500U in this item, play back the MHV-2H alignment tape since it has no INPUT terminal.***
						
14	**PB Y COMB-2**	TP24 : 15E (VIDEO-2)	R279 : 11D R389 : 14E (VIDEO-2)	Color bar ↓ TP23:10B (VIDEO-2)	E-E	(1) Shortcircuit between TP21(:10B) and TP22(:11B) on the VIDEO-2 board with a shorting wire. (2) Input color bars signal (2Vp-p) to between TP23(:10B) and TP-GND8(:9B) on the VIDEO-2 board. (3) Adjust R279 and R389 alternately to minimize chroma leak at TP24. (4) After the adjustment, remove the shorting wire from TP21 and TP22.
						
15	**PB Y level**	Y/C 358 ▪Y OUT (75Ω terminator)	R171 : 4G (VIDEO-2)	Color bar	REC VHS ↓ PB	(1) Observing output of the Y/C358 Y OUT terminal, adjust R171 so that the difference between the 100% white level and the pedestal level is 0.714Vp-p (100IRE). ***Note :*** ***For adjusting the BR-S500U in this item, play back the MHV-2 alignment tape since it has no INPUT terminal.***
						
			R174 : 3G R252 : 14G (VIDEO-2)	Color bar	REC S-VHS ↓ PB	(2) Observing output of the Y/C358 Y OUT terminal, adjust R174 so that the difference between the 100% white level and the pedestal level is 0.714Vp-p (100IRE). (3) Adjust R252 so that the sync level becomes 0.286Vp-p (40IRE). ***Note :*** ***For adjusting the BR-S500U in this item, play back the MHV-2H alignment tape since it has no INPUT terminal.***
						

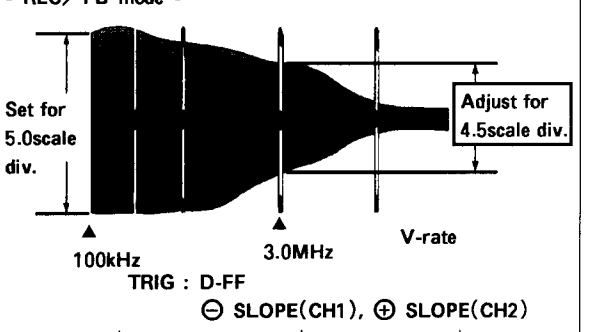
- *The test point of D-F.F. output is TP102(:7G) on the [1][2] AV PRE/REC board.*
- *For adjusting the VIDEO circuit, set the MENU switch No.101 (EDIT SELECT) to "DUB or EDIT" (1).*

No.	Item	Check point	Adjustment	Signal	Mode	Check and Adjustment
16	**S-VHSmode RF equalizer**	VIDEO OUT (75Ω terminator)	R212 : 13G (CH1) R213 : 13G (CH2) (VIDEO-2)	MBV-3H	PB S-VHS	(1) Make sure that the MENU switch No.101 is set to "DUB or EDIT". (2) Play back the MBV-3H alignment tape and adjust the TRACKING VR to the optimum position. (3) Observing the 100kHz signal level on the oscilloscope, adjust the oscilloscope's GAIN control to set it for 5.0scale divisions. (4) In the above-mentioned condition, adjust R212 (CH1) and R213 (CH2) so that the 3MHz signal level becomes for 4.5scale divisions (−1.0 dB) respectively.
			R218 : 12G (CH1) (VIDEO-2)	Sweep (nonburst)	REC S-VHS ↓ PB	***Note :*** ***This set has no function of EP recording. Therefore, use a sweep signal recorded by the BR-S925U for adjusting this set in this item.*** (5) Record a sweep signal in the S-VHS 6H mode by the BR-S925. (6) Play back the signal recording in the above step (5) in the EP mode by this set. (7) Observing the playback sweep signal, set it for 5.0scale divisions on the oscilloscope. (8) Adjust R218 so that the 3.0MHz signal level becomes for 4.0scale divisions. ***Note :*** ***If there is a level difference in channels, use the lower level for adjustment.***
17	**BR-S800U REC frequency response**	VIDEO OUT (75Ω terminator)	C194 : 2G (CH1) C193 : 3G (CH2) (VIDEO-2)	Sweep (nonburst) ↓ Y/C 358 •Y IN	REC S-VHS ↓ PB	(1) Record a sweep signal and play it back. (2) Set the 100kHz signal level for 5.0scale divisions on the oscilloscope screen, and adjust C194 (CH1) and C193 (CH2) so that the 3.0MHz signal level becomes for 4.5scale divisions (−1.0 dB) respectively.



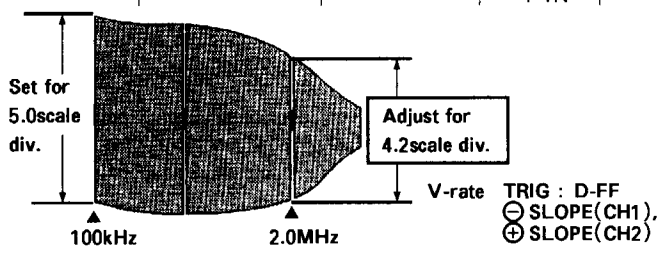


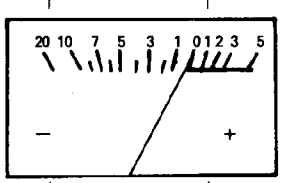
- REC/PB mode -



- *The test point of D-F.F. output is TP102(:7G) on the 1 2 AV PRE/REC board.*
- *For adjusting the VIDEO circuit, set the MENU switch No.101 (EDIT SELECT) to "DUB or EDIT" (1).*

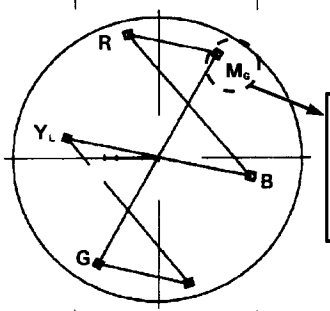
No.	Item	Check point	Adjustment	Signal	Mode	Check and Adjustment
18	**VHS mode RF equalizer**	VIDEO OUT (75Ω terminator)	R188 : 11G (CH1) R189 : 11G (CH2) (VIDEO-2)	Sweep (nonburst) ↓ Y/C 358 •Y IN	REC VHS ↓ PB	(1) Make sure that the MENU switch No.101 is set to "DUB or EDIT". (2) Record a sweep signal and play it back. (3) Adjust the GAIN control of the oscilloscope to set the 100kHz signal level for 5.0scale divisions on the oscilloscope screen. (4) In the above condition, adjust R188 (CH1) and R189 (CH2) so that the 2MHz signal level is for 4.2scale divisions (−1.5dB) respectively. ***Note :*** ***For adjusting the BR-S500U in this item, play back the MH-6 alignment tape since it has no INPUT terminal.***
19	**Tracking meter**	TRACKING METER	R86 : 9F (VIDEO-2)	Color bar	REC VHS ↓ PB	(1) Set the METER SELECT switch to "TRACKING", and make sure that the TRACKING VR is set to the center click position. (2) Record a color bars signal and play it back. (3) Adjust R86 so that the pointer of the TRACKING METER indicates 0 as viewed from the right front. ***Note :*** ***For adjusting the BR-S500U in this item, record a color bars signal by the BR-S800U and play it back by the BR-S500U since the latter has equipped with no INPUT terminal. Moreover, make sure to set the TRACKING VR to an optimum position.***
20	**Logical COMB**	TP12 : 15D (VIDEO-1)	R166 : 13G R259 : 14G (VIDEO-1)	Multi burst ↓ TP8:15A (VIDEO-1)	PB (MBV-3H)	(1) Shortcircuit between TP9(:9F) and TP10(:13B) on the VIDEO-1 board with a shorting wire. (2) Input a multi-burst signal (2.0Vp-p) to between TP8 and TPGND on the VIDEO-1 board. (3) Set SW1(:15D) on the VIDEO-1 board to "ADJ". (4) Shortcircuit between TP6(:14F) and TPGND on the VIDEO-1 board with a shorting wire. (5) Play back the MBV-3H alignment tape. (6) Observing waveform of TP12's signal, adjust R166 and R259 alternately to minimize the level of the 3.58MHz segment. ***Note :*** ***Since the 3.58MHz signal segment differently appears depending on the signal generator, make sure to learn the specifications of the signal generator to be used beforehand.***
			R164 :14G R258 : 15G (VIDEO-1)	Multi burst ↓ TP8	PB (MBV-3H)	(7) Remove the shorting wire from TP6 and TPGND. (8) Play back the MBV-3H alignment tape. (9) Observing waveform of TP12's signal, adjust R164 and R258 alternately to minimize the level of the 3.58MHz segment. ***Note :*** ***Since the 3.58MHz signal segment differently appears depending on the signal generator, make sure to learn the specifications of the signal generator to be used beforehand.*** (10) Remove the shorting wire from TP9 and TP10, and return the setting of SW1 to "NOR".



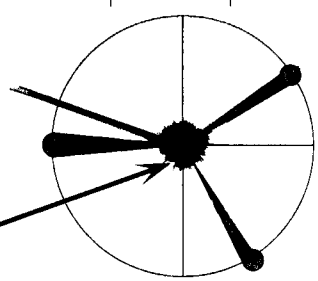


- *The test point of D-F.F. output is TP102(:7G) on the 1 2 AV PRE/REC board.*
- *For adjusting the VIDEO circuit, set the MENU switch No.101 (EDIT SELECT) to "DUB or EDIT" (1).*

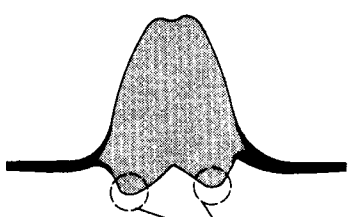
No.	Item	Check point	Adjustment	Signal	Mode	Check and Adjustment
21	**CNR**	TP7 : 14D (VIDEO-1)	R156 : 13D R159 : 13D (VIDEO-1)	MHV-2H	PB	(1) Make sure that the MENU switch No.101 to "DUB or EDIT". (2) Take note of the position of magenta luminous dot on the vectorscope. (3) Set the MENU switch No.101 to "OFF (PB)". (4) Adjust the position of the magenta luminous dot to be the same as that in the above step (2) with R156 and R159 (5) After the adjustment, return the MENU switch No.101 to "DUB or EDIT" position.
22	**Carrier balance**	VIDEO OUT (75Ω terminator) ↓ Vectorscope	R219 : 10G R220 : 11G (VIDEO-1)	MHV-2H	PB	(1) Connect the vectorscope to the VIDEO OUT terminal. (2) Adjust R219 and R220 alternately to collect luminescent spots appearing in the center of the waveform in the center of the vectorscope screen.
23	**PB Y/C delay**	Y/C 358 OUT (75Ω terminator)	R201 : 9G (VIDEO-1)	Pulse & bar	REC S-VHS ↓ PB	(1) Mix output signals of the Y/C358 Y OUT and the Y/C358 C OUT terminals in the oscilloscope which is triggered by the output signal of the Y OUT terminal. (2) Record pulse & bar signal and play it back while adjusting R201 to symmetrize the modulated 12.5T pulse in the bottom. ***Note :*** ***For adjusting the BR-S500U in this item, record a pulse & bar signal by the BR-S800U and play it back by the BR-S500 since the latter has no INPUT terminal.***



Adjust the level and phase of the magenta so that they are constant despite of setting of the memory switch No.101 to "DUB" or "OFF".

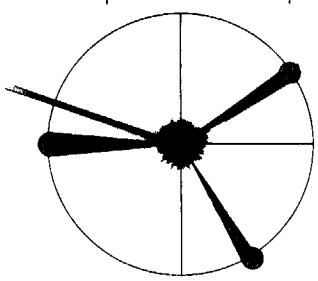
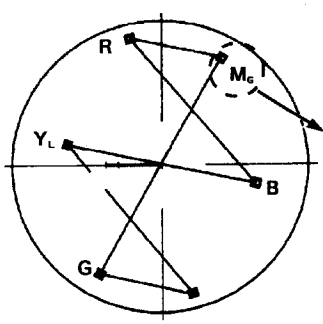
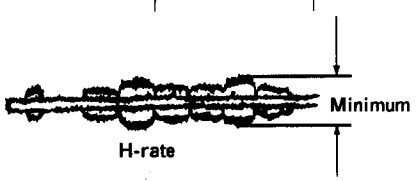


Collect luminescent spots in the center of waveform in the center of vectorscope with R219 and R220.



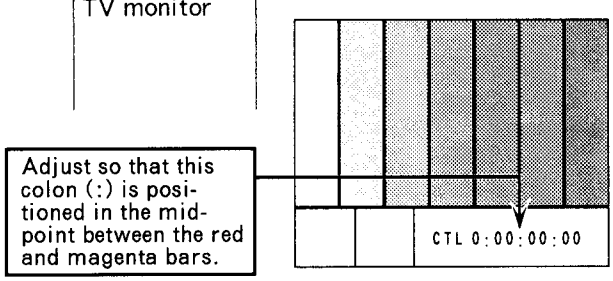
Flat or symmetric

- *The test point of D-F.F. output is TP102(:7G) on the 1 2 AV PRE/REC board.*
- *For adjusting the VIDEO circuit, set the MENU switch No.101 (EDIT SELECT) to "DUB or EDIT" (1).*

No.	Item	Check point	Adjustment	Signal	Mode	Check and Adjustment
24	**Color (burst) level & phase**	VIDEO OUT (75Ω terminator) ↓ Vectorscope	R217 : 12G (burst) (VIDEO-1)	Color bar	REC S-VHS ↓ PB	(1) Input a color bars signal directly to the vectorscope (with 75Ω terminator) while adjusting the vectorscope's GAIN control to position the luminescent spot of the burst signal at the 0dG point in the −(B-Y) axis on the vectorscope screen. (2) Connect the vectorscope's channel that the gain is adjusted in the above step (1) and the VIDEO OUT terminal with each other. (3) Record a color bars signal and play it back. (4) Adjust R217 to position the luminescent spot of the burst signal at the 0 dG point on the vectorscope. ***Note :*** ***For adjusting the BR-S500U in this item, play back the MHV-2H alignment tape since it has equipped with no INPUT terminal.***
		 **Utilizing the radius of the vectorscope screen's circumference as a ruler, adjust R217 to equalize the playback burst level of the self-recorded signal with the burst level of the directly input color bars signal.**				
			R221 : 11G (level) R208 : 10G (phase) (VIDEO-1)	Color bar	REC S-VHS ↓ PB	(5) Adjust the vectorscope's GAIN control to return the luminescent spot of the burst signal to the original position. (6) Alternately adjust R221 (LEVEL) and R208 (PHASE) to position the luminescent spot of the magenta in the ⊞ mark on the vectorscope screen. ***Note :*** ***For adjusting the BR-S500U in this item, play back the MHV-2H alignment tape since it has equipped with no INPUT terminal.***
		 **Alternately adjust R221 and R208 to position luminescent spot in the ⊞ mark.**				
25	**Color DOC**	Both end of L17(:14D) (VIDEO-1)	R250 : 12D R253 : 12D (VIDEO-1)	MHV-2H	PB	(1) Connect the oscilloscope's CH1 with an end of L17 and CH2 with the other end of L17. (2) Inverse the CH2 signal and mix it with the CH1 signal. (3) Adjust R250 to minimize the output level of the mixed signal. (4) Adjust R253 to minimize the level moreover.
						

- ***The test point of D-F.F. output is TP102(:7G) on the [1][2] AV PRE/REC board.***
- ***For adjusting the VIDEO circuit, set the MENU switch No.101 (EDIT SELECT) to "DUB or EDIT" (1).***

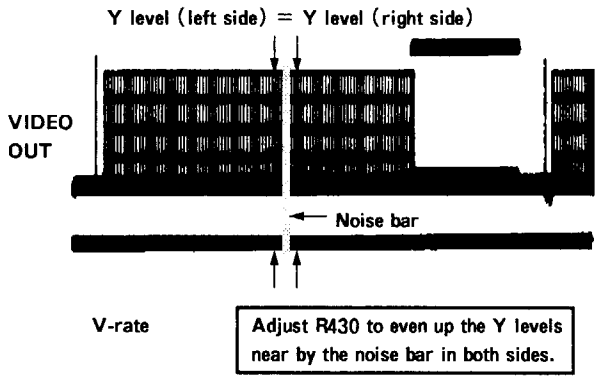
No.	Item	Check point	Adjustment	Signal	Mode	Check and Adjustment
26	**Slow tracking**	VIDEO OUT (75Ω terminator) ↓ TV monitor	TRACKING VR	Color bar	REC [S-VHS] ↓ PB ↓ SEARCH (×1/30)	(1) Turn off the power switch. (2) Depress the FF, REW and COUNTER RESET button at the same time while turning on the power switch again. (3) Press the MENU switch to get "03 00" appearing in the counter display. (4) Record a color bars signal, and play it back in the step slow mode at the speed of ×1/30 (+0.03). (5) Press the +SHIFT button and adjust the TRACKING VR to eliminate noise from the monitor screen. (6) Press the AUTO MODE button and confirm that "03 End" is appearing in the counter display. (7) Turn off the power switch. ***Note : For adjusting the BR-S500U in this item, play back the MHV-2H alignment tape since it has no INPUT terminal.***
27	**V lock**	TV monitor	TRACKING VR	Color bar	REC [S-VHS] ↓ PB ↓ STILL	(1) Record a color bar signal and play it back in the Still mode. (2) Observing the still picture on the monitor screen, adjust the TRACKING VR to minimize fluctuation of the picture. (3) Enter the set into the Stop mode. ***Note : For adjusting the BR-S500U in this item, play back the MHV-2H alignment tape since it has no INPUT terminal.***
28	**Onscreen**	MONI OUT ↓ TV monitor	C220 : 5E (AV I/O)	Color bar	E-E	(1) Set the COUNTER switch to "CTL" position. (2) Connect the TV monitor to the MONITOR OUT terminal. (3) Adjust C220 so that this colon (:) is positioned in the midpoint between the red and magenta bars. ***Note : For adjusting the BR-S500U in this item, play back the MHV-2H alignment tape since it has no INPUT terminal.***
		TP205 : 5F (AV I/O) ↓ Frequency counter	C226 : 6E (AV I/O)	–	E-E	(1) As the set is in "eject" mode, turn off the power switch. (2) Turn on the power switch again, and press the EJECT and STOP buttons simultaneously within 2sec after the counter indicator is on. (3) When "OPEn" appears in the counter display, press the IN/+SHIFT button 11 times, and then "On-Adj" will appear in the counter display. (4) Adjust C226 to obtain 14.318MHz as the frequency of TP205's signal. (Ground : TPGND202 : 4E)



TP205 : 14.318±0.001MHz

- *The test point of D-F.F. output is TP102(:7G) on the 1 2 AV PRE/REC board.*
- *For adjusting the VIDEO circuit, set the MENU switch No.101 (EDIT SELECT) to "DUB or EDIT" (1).*

No.	Item	Check point	Adjustment	Signal	Mode	Check and Adjustment
29	**Still PB Y**	VIDEO OUT (75Ω terminator)	R430 (VIDEO-2)	Color bar	REC S-VHS ↓ PB ↓ STILL	(1) Connect a TV monitor with the MONITOR OUT terminal and set the MENU switch No. 337 (SLOW MODE) to "LINEAR" (0). (2) Record the color bar signal and play it back in the STILL mode. (3) While observing the TV monitor, adjust the SEARCH dial to position the noise bar in the center of the screen. (4) Observe the waveform with an oscilloscope, adjust R430 to even up the Y levels near by the noise bar in both sides. ***Note :*** ***The BR-S500U is not equipped with any input terminal. Therefore, play back the MHV-2H alignment tape for adjusting the BR-S500U for this item.***


Y level (left side) = Y level (right side)
VIDEO OUT
Noise bar
V-rate
Adjust R430 to even up the Y levels near by the noise bar in both sides.

3. 5 POWER SUPPLY CIRCUIT

No.	Item	Check point	Adjustment	Signal	Mode	Check and Adjustment
1	**Regulator voltage**	TP2 (REGULATOR)	R74 (REGULATOR)	–	REC	(1) Adjust R74 so that voltage at TP2 is $5.30 \pm 0.05 V_{DC}$.
		TP1 (REGULATOR)	R41 (REGULATOR)	–	REC	(1) Adjust R41 so that voltage at TP1 is $12.50 \pm 0.05 V_{DC}$.

SECTION 7
TECHNICAL INFORMATION

7.1 HOUR METER INDICATIONS

7.1.1 Outline

This model is capable of indicating the following data in the on-screen display besides running hours of the drum motor.

(1) Total operation (power-on) hours (POWER HOUR METER)
(2) Running hours of capstan motor (CAP HOUR METER)
(3) Running hours of reel motor (REEL HOUR METER)
(4) Number of switching-on times (POWER ON TIMES)
(5) Number of loading times (LOADING TIMES)
(6) Number of ejection times (EJECT TIMES)
(7) Number of times of head cleaner operation (HEAD CLEANING TIMES)
(8) Version No. of the CPU program (XXX ROM Ver.)

Those data are shown in the counter display on the front panel and the on-screen display.

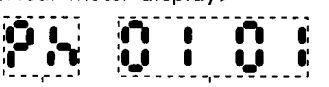
7.1.2 Operation procedure

(1) Without any cassette inserted, press the EJECT and MENU buttons at the same time.
(2) The version number of the EP-ROM of the SYSCON board appears in the counter display.
(3) Every time the IN/+SHIFT or the OUT/−SHIFT button is pressed, the displayed item changes one after another as shown in the right column. Detail of each display is as follows.

<Program version display>

- Version No. of program
- ID No. of CPU
  - 01; SYSCON
  - 10; M-CTL
  - 15; AUDIO
  - 20; JVC 45 PIN(SA-K28UA)
  - 21; RS-232C(SA-K27UA)
  - 22; RS-422(SA-K26U)
  - 40; Time code(SA-R50U)
  - 80; DNR(SA-N50U)
- Board name
  - Sy: SYSCON board
  - SE: SERVO/M-CTL board
  - AU: FM AUDIO board
  - S1: Board connected to the slot-1
  - S2: Board connected to the slot-1
  - S3: Board connected to the slot-2
  - S4: Board connected to the slot-2

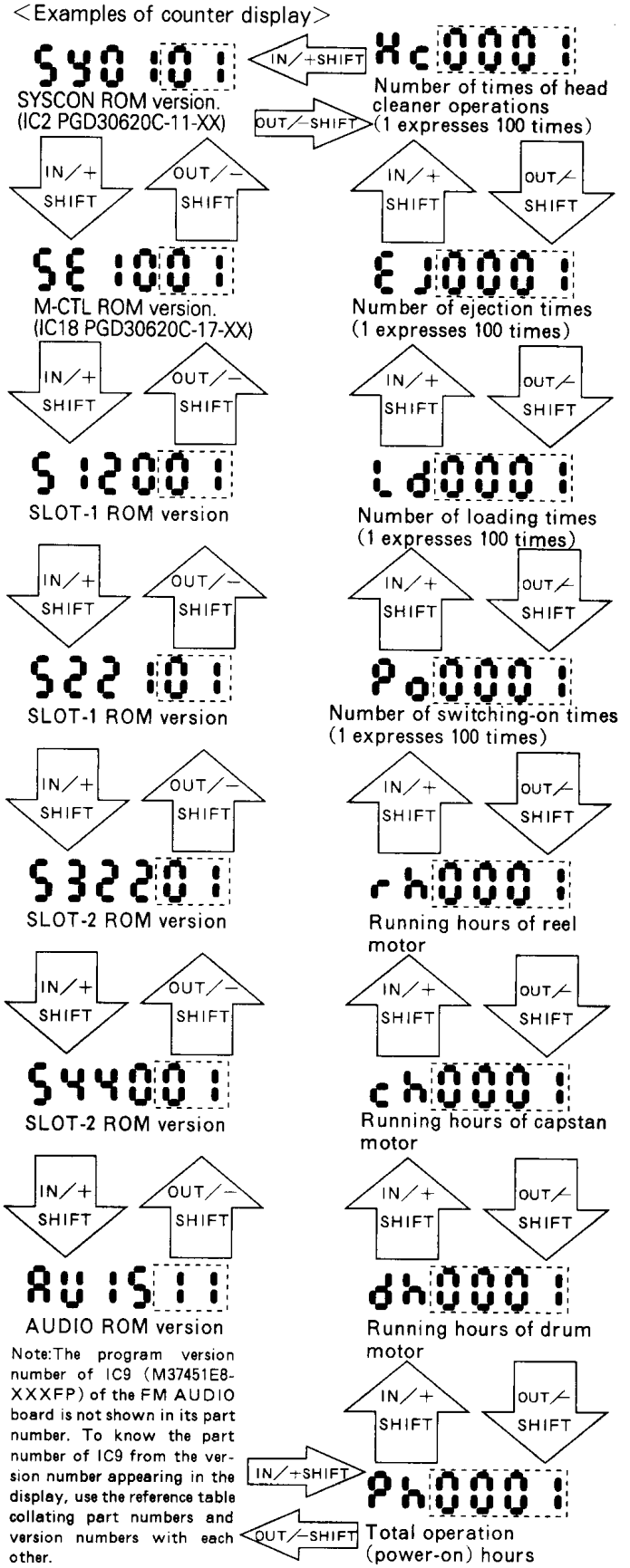
<Hour meter display>



- Hours (unit: hour) or Number of operation times (unit: 100 times)
- Item of indication

(4) To reset the display to the original indication, press the MENU button once to reset it to the MENU SETTING display or press it one more again to reset it to the TAPE COUNTER display.

<Examples of counter display>


SYSCON ROM version. (IC2 PGD30620C-11-XX)
IN/+SHIFT
OUT/−SHIFT
Number of times of head cleaner operations (1 expresses 100 times)
M-CTL ROM version. (IC18 PGD30620C-17-XX)
Number of ejection times (1 expresses 100 times)
SLOT-1 ROM version
Number of loading times (1 expresses 100 times)
SLOT-1 ROM version
Number of switching-on times (1 expresses 100 times)
SLOT-2 ROM version
Running hours of reel motor
SLOT-2 ROM version
Running hours of capstan motor
AUDIO ROM version
Running hours of drum motor
Total operation (power-on) hours

Note:The program version number of IC9 (M37451E8-XXXFP) of the FM AUDIO board is not shown in its part number. To know the part number of IC9 from the version number appearing in the display, use the reference table collating part numbers and version numbers with each other.

Part No.	Version	Part No.	Version
M37451E8-501FP	1	M37451E8-505FP	20
M37451E8-502FP	2	M37451M8-521FP	20
M37451E8-504FP	11		

Note : In the on-screen display, the number of operation times is indicated at a unit of one time.

7.2 SERVICE MENU

7.2.1 Outline

The service menu of this model includes the following functions.

(1) To set menu switches for servicing.
(2) To register and call user setting of menu switches.
(3) To reset menu switch setting to the initial setting at factory shipment.
(4) To show the history of warnings.

7.2.2 Access procedure to service menu

(1) Take the cassette tape out of the set and then turn off the power switch.
(2) Turn on the power switch again and press the EJECT and STOP buttons simultaneously within 2 seconds after the counter display goes on.
(3) "OPEn" appears in the counter display.
(4) Press the IN/+SHIFT button to show a desired menu.

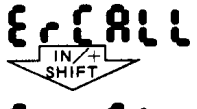
OPEN
Menu to open the service menu switch.

ENTER
Menu to register user setting of menu switch.

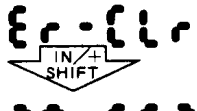
CALL
Menu to call up registered menu switch setting.

RESET
Menu to reset the menu switch to the initial setting at factory shipment.

For factory use.



ERROR CALL
Menu to show the history of warnings.

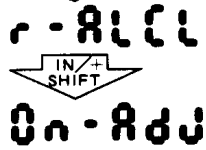


ERROR CLEAR
Menu to reset data of the warning history.

For factory use.

TRACKING ADJUSTMENT
Menu to adjust tracking preset.

For factory use.



For factory use.

ON-SCREEN ADJUSTMENT
Menu for adjustment of the on-screen circuit.

The display returns to the OPEN menu. Continuous pressing of the IN/+SHIFT button shows the above service menues repeatedly.

7.2.3 Operation procedure

(1) Menu switch setting for service use

Besides the menu switches explained in the instructions, there are other menu switches for service use provided in this set. This subsection explains procedures to change the setting of those menu switches.

1) Access the service menu and get "OPEn" appearing in the counter display. (Refer to 7.2.2.)
2) Press the SET button on the front panel and then press the MENU button. All menu switches will be opened.
3) With the IN/+SHIFT and the OUT/−SHIFT buttons, access the menu number to be desired to change on the counter display.
4) Change the setting with the SET button.
5) To quit or cancel the service mode, press the MENU button.

(2) Registering procedure of user setting of Menu SW

1) Access the service menu and get "EnTEr" appearing in the counter display. (Refer to 7.2.2.)
2) Press the SET button on the front panel and the current menu switch setting is registered.

(3) Calling procedure of user setting of Menu SW

1) Access the service menu and get "CALL" appearing in the counter display. (Refer to 7.2.2.)
2) Press the SET button on the front panel and the menu switch setting is reset as it was registered in the above item (2) 'Registering procedure of user setting of menu switches'.

(4) Initializing procedure of Menu switch setting as it was set at factory shipment

1) Access the service menu and get "rESET" appearing in the counter display. (Refer to 7.2.2)
2) Press the SET button on the front panel and the menu switch setting is reset to the initial setting at factory shipment.

(5) Tracking preset adjustment mode

The tracking preset adjustment is necessary to obtain the optimum tracking as the tracking control knob is set at the center click position, since there is irregularity in the characteristics of variable resistors used for tracking adjustment. The tracking preset adjustment of this model is so simplified compared with previous models as just to store the output voltage with the tracking control being set at the center click position in the memory of the microprocessor.

1) Access the service menu and get "Tr-AdJ" appearing in the counter display. (Refer to 7.2.2.)
2) Set the tracking control knob at the center click position.
3) Press the SET button, and the microprocessor memorizes the output voltage of the tracking control.

(6) On-screen adjustment mode

The on-screen adjustment mode is used to adjust the oscillation frequency of the crystal used in the on-screen circuit. Previous models require to shortcircuit test points for this adjustment, however, this model is so improved that such troublesome shortcircuiting is replaced by this mode.

(7) Warning history clearning procedure

This model stores data of the last four warning modes. Use the warning history clearing menu to clear the stored data of past warnings.

1) Access the service menu and get "Er-CLr" appearing in the counter display. (Refer to 7.2.2.)
2) Press the SET button and the stored warning data is cleared.

Note : The menu switches for servicing are not shown in the on-screen display.

[ ] : initial settings.

Menu No.	Item	Function	Counter	Explanation
		● SERVO		
000	FRAME SERVO		[0],1	MENU SW-1 Initial setting : 2FIELD
001	TBC CONNECT		[0],1	MENU SW-2 Initial setting : OFF
002	OPERATION LOCK		[0],1	MENU SW-1 Initial setting : OFF
003	SYNC SELECT		0,1,2,[3]	MENU SW-1 Initial setting : AUTO
004	AUTO H PHASE		0,[1]	MENU SW-2 Initial setting : ON
		● VIDEO		
100	S-VHS SELECT		0,[1]	MENU SW-1 Initial setting : AUTO
101	EDIT SELECT		[0],1,2	MENU SW-1 Initial setting : OFF(PB)
106	SWITCHING POINT	Selects drum rotation phase	[0]	6.5H
			2	2.25H (Use this setting when you want a lower switching point for closed-circuit system.)
		● AUDIO		
200	Hi-Fi AUDIO REC		0,[1]	MENU SW-1 Initial setting : ON
201	NORMAL AUDIO DOLBY NR		0,[1]	MENU SW-1 Initial setting : ON
202	NORMAL AUDIO LIMITER		0,[1]	MENU SW-1 Initial setting : ON
203	AUDIO OUTPUT SELECTER		[0],2	MENU SW-2 Initial setting : SEP
204	Hi-Fi OUT AT SEARCH		[0],1	MENU SW-2 Initial setting : MUTE
205	AUDIO-1 REC		[0],1	MENU SW-1 Initial setting : AUDIO-1
206	AUDIO-2/LTC		[0],1	MENU SW-2* Initial setting : AUDIO-2
207	AUDIO INPUT SELECT		[0],1	MENU SW-2 Initial setting : SEP
208	AUDIO DUB SELECT		1,[2],3	MENU SW-1 Initial setting : AUDIO-2
		● SYSTEM		
300	DIRECT EJECT		0,[1]	MENU SW-2 Initial setting : ENABLE
301	DIRECT SEARCH		0,[1]	MENU SW-2 Initial setting : ENABLE
302	AUTO REC PREROLL		0,[1]	MENU SW-2 Initial setting : ENABLE
303	WARNING ENABLE	Normally keep this menu to "0"side.	[0]	Warning mode is enabled.
			1	Warning mode is not enabled.
304	RECORDING INHIBIT		[0],1	MENU SW-2 Initial setting : OFF
305	REPEAT RECORDING		[0],1	MENU SW-2 Initial setting : DISABLE
306	LONG PAUSE	Long pause parameters are selected with menu item #307~#310.	[0]	Long pause function is enabled.
			1	Long pause fonction is not enabled.
307	LONG PAUSE TIME	With menu item #306 set to "0" (ENABLE) ,selects the length of time before normal Pause (STOP, STILL and REC-PAUSE) changes to Long Pause.	0	Long pause starts 1 sec. after.
			1	Long pause starts 10 sec. after.
			2	Long pause starts 30 sec. after.
			3	Long pause starts 1 min. after.
			4	Long pause starts 2 min. after.
			5	Long pause starts 3 min. after.
			6	Long pause starts 4 min. after.
			[7]	Long pause starts 5 min. after.
308	LONG PAUSE (STILL) MODE	Selects the contents of Long Pause mode. (After the time set with menu item #307 expires in Still or Record-Pause mode,the VCR operates as specified.)	[0]	Standby off mode takes place.
			2	Every time the period of time set by the menu item #307 elapses, the tape is forwarded for 2 frames. (After this operation is repeated six times, the mode is shifted to the standby off mode.)
309	LONG STOP MODE	Selects the contents of Long Pause mode. (After the time set with menu item #307 expires in Stop mode, the VCR operates as specified.)	[0]	Standby off mode takes place.
			2	Every time the period of time set by the menu item #307 elapses, the tape is forwarded for 2 frames. (After this operation is repeated six times, the mode is shifted to the standby off mode.)

* When SA-R50 is installed, this menu will change to Menu switch-1.

Table 7-2-1 (1) Table of menu switches for service use

Note : The menu switches for servicing are not shown in the on-screen display. [ ] : initial settings.

Menu No.	Item	Function	Counter	Explanation
		● SYSTEM		
310	STAND-BY OFF MODE	Selects the status of Standby-off mode.	0	Drum rotates, pinch roller is off.
			[1]	Drum stops, pinch roller is off.
			2	Unloading end state.
312	MODE AT TAPE END		[0],1	MENU SW-2 Initial setting : STOP(SHORT REW)
313	PB•PB/EE SELECT	Selects output signal.	[0]	In the mode set by Menu No.314 : EE
			1	Always PB output mode.
314	PB/EE MODE	With menu item #313 set to "0" (PB/EE), selects the mode in which EE signal is output.	[0]	In STOP/FF/REW mode : EE
			1	In STOP : EE
315	LOCAL FUNCTION	Selects operation button to be accepted when REMOTE SW is set to REMOTE side.	[0]	STOP/EJECT
			1	STP/FF/REW/STL/PLY/EJ
			2	All buttons are accepted.
			3	All bottons are not accepted.
316	9PIN CMD FUNCTION (SA-K26)	Selects 9-pin remote control commands that are acceptable when front panel REMOTE switch is set to LOCAL.	[0]	Accepts no command from 9-pin remote control.
			1	Accepts STOP and EJECT command only.
317	9PIN DEVICE TYPE ID (SA-K26)		[0],1,2,3	MENU SW-2 Initial setting : JVC S-VHS-1
318	TC DATA W/O TC BOARD	Selects VCR's response to 9-pin remote control when remote control requests time code data and time code board is not installed.	0	VCR returns code meaning TC MISSING.
			[1]	VCR returns substitute CTL data.
319	TAPE MAX SPEED		[0],1,2	MENU SW-2 Initial setting : ×100
320	PREROLL TIME	Selects preroll time in one-second steps from 0 to 15 seconds. (This menu is available only when receiving the PREROLL command.)	0 : [5] : F	0 second 5 seconds 15 seconds
321	TIME REFERENCE FOR PREROLL	Selects time count reference for preroll in TC operation.	0	CTL (Preroll is possible even when TC is missing.)
			[1]	TC
322	IN POINT AUTO ENTRY (SA-K26)	Activates or defeats automatic IN point entry function when receiving the PREROLL command.	S800 S500 0 [0]	IN point is not entered automatically.
			[1] 1	IN point is entered automatically if no IN point has been previously entered.
323	MODE AFTER PREROLL	Selects the mode after preroll or cue up is completed. (This menu is available only when receiving the PREROLL or CUE UP WITH DATA command.)	[0]	STOP
			1	STILL
325	CTL COUNTER MODE	Selects the CTL counter mode.	[0]	±9H mode
			1	24H mode
327	CTL CLEAR AT EJECT	Activeates or defeats automatic CTL data and IN/OUT point data reset function when cassette is ejected.	0	CTL counter is reset when cassette is ejected.
			[1]	CTL counter is not reset when cassette is ejected.
328	EDIT POINT CLEAR (SA-K26)	Activates or defeats automatic IN/OUT point data clear function after Auto edit is completed. (This menu is available only when receiving AUTO EDIT command.)	0	DISABLE
			[1]	ENABLE
329	OUT POINT RETURN (SA-K26)	Activates or defeats automatic OUT point return function after Auto edit is completed. (This menu is available only when receiving AUTO EDIT command.)	0	DISABLE
			[1]	ENABLE
330	VIDEO EDIT DELAY		[0],1	MENU SW-2 Initial setting : 8FRAMES
331	AUDIO EDIT DELAY		[0],1	MENU SW-2 Initial setting : 8FRAMES

Table 7-2-1(2) Table of menu switches for service use

Note : The menu switches for servicing are not shown in the on-screen display.

[ ] : initial settings.

Menu No.	Item	Function	Counter	Explanation
		● SYSTEM		
333	CF SERVO LOCK REPLY	Selects information to deliver to 9-pin remote when remote control requests status of 8-field colour frame lock. (S-VHS VCR does not have 8-field colour frame servo circuit.)	[0]	The bit of CF SERVO LOCK is always set to "0".
			1	The bit of CF SERVO LOCK is set to "1" when the capstan servo is locked to 4-field colour frame.
336	NTSC/PAL	Selects PAL/NTSC.	[0]	NTSC
			1	PAL
337	SLOW MODE		0,[1]	MENU SW-2 Initial setting : STEP
338	MENU SW-2		[0],1	MENU SW-1 Initial setting : CLOSE
339	AUDIO DUB ENABLE AT LTC		[0],1	MENU SW-2* Initial setting : DISABLE
340	SEARCH SPEED		[0],1	MENU SW-2 Initial setting : ×33
343	SUB WARNING INHIGIT		[0]	OFF : Enters the Warning mode
			1	ON : Enters the Stop or Eject
351	SYNCHRONIZATION		0,[1]	MENU SW-2 Initial setting : ENABLE
		● TIME-CODE (SA-R50)		
400	VITC POSITION-1		0~A,[6]	MENU SW-1 Initial setting : 16
401	VITC POSITION-2		0~A,[8]	MENU SW-1 Initial setting : 18
403	TCG REGEN MODE		[0],1,2	MENU SW-2 Initial setting : TC & UB
404	TC SOURCE AT REGEN	Selects the type of reference timecode in Internal Regen mode (with menu items #413 set to INT and #414 set to REGEN) and Auto Reader mode (with menu item #412 set to AUTO).	[0]	LTC
			1	VITC
405	LTC OUT SELECT		[0],1	MENU SW-2 Initial setting : OFF TAPE
406	U-BIT BINARY GROUP	Selects character set configuration to use TC generator's user bits.	[0]	NOT SPECIFIED : Character set configuration is not specified.
			1	ISO CHARACTER : 8-bit character set conforming to ISO646 and ISO2022 (with binary group flags at bit counts 43 and 59 in LTC; at 55and 75 in VITC).
			2	UNASSIGNED-1 : Undefined
			3	UNASSIGNED-2 : Undefined
407	PHASE CORRECTION BIT	Selects recording of LTC phase correction bit.	0	OFF
			[1]	ON
408	VITC LINE	Selects whether VITC is recorded on the lines set with menu items #400 and #401.	[0]	VITC is recorded after lines are cleaned.
			1	Lines are cleaned.
409	EXTERNAL REGEN TC		[0],1	MENU SW-2 Initial setting : LTC
410	AUTO REGEN MODE	Selects the edit mode in which time codes are recorded automatically in Regen mode regardless of menu item #414 setting. (This menu is available only when receiving AUTO EDIT command.)	[0]	ASSEMBLY + INSERT
			1	ASSEMBLY
			2	INSERT
			3	OFF
411	–	No function	0,[1]	
412	TIME CODE SELECT		1,2,3	MENU SW-1 Initial setting : [2] VITC(with SA-N50U) [1] LTC(w/o SA-N50U)
413	TCG SOURCE		[0],1	MENU SW-1 Initial setting : INTERNAL
414	TCG SELECT		0,[1]	MENU SW-1 Initial setting : REGEN
415	TCG MODE		[0],1	MENU SW-1 Initial setting : FREE RUN
416	DROP/NON DROP		0,[1]	MENU SW-1 Initial setting : FREE RUN
417	VITC REC		0,1	MENU SW-1 Initial setting : [1] ON(with SA-N50U) [0] OFF(w/o SA-N50U)
418	VITC•LTC/CTL TC		[0],1	MENU SW-1 Initial setting : VITC•LTC

* When SA-R50 is installed, this menu will change to Menu switch-1.

Table 7-2-1(3) Table of menu switches for service use

Note : The menu switches for servicing are not shown in the on-screen display. [ ] : initial settings.

Menu No.	Item	Function	Counter	Explanation
		● ON SCREEN		
500	ON-SCREEN DISPLAY		0,[1]	MENU SW-1 Initial setting : ON
501	CHAR. H POSITION	Adjusts on-screen VCR data display position in the horizontal direction.	[0]	VCR data is displayed at the rightmost position.
			1-8	Display position shifts to the left with increasing numbers.
502	CHAR. V POSITION	Adjusts on-screen VCR data display position in the vertical direction.	[0]	VCR data is displayed at the bottom of screen.
			1-8	Display position shifts up with increasing numbers.
504	INFORMATION		0,[1]	MENU SW-2 Initial setting : TIME+MODE
506	BLUE BACK	Blue back ON/OFF switch.	0	Black
			[1]	Blue
507	BACK SELECT	For selecting the mode that outpus blue back when there is no signal input.	[0]	ALL : Blue back is output in E-E mode and in playback of NON-Recording tape.
			1	E-E ONLY : Blue back is output in E-E mode only.
		● DNR (SA-N50)		
600	TBS FREEZE		0,1,[3]	MENU SW-1 Initial setting : FREEZE-2
602	TBS/ DNR		0,[1]	MENU SW-1 Initial setting : ON
604	YNR LEVEL		0,[1],2,3	MENU SW-1 Initial setting : 1
605	CNR LEVEL		0,[1],2	MENU SW-1 Initial setting : 1
606	VERTICAL ENH LEVEL		[0],1,2,3	MENU SW-1 Initial satting OFF
610	FORCED DNR ON (SA-N50)	Adjustment switch	[0]	NORMAL
			1	ADJUSTMENT : DNR operates even in EE mode.

Table 7-2-1(4) Table of menu switches for service use

(8) Calling procedure of warning history

This model stores the following data of past warning modes that the set entered for the last four times so as to inform the warning modes in detail.

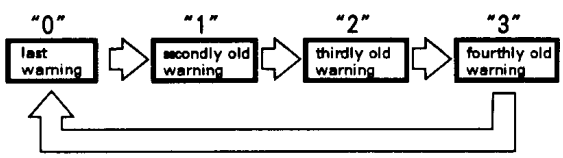
a) Warning code in three figures.
b) Operation mode of the set when the warning was activated.
c) Operation mode of the set preceding the mode in which the warning was activated.
d) Operation button that was lastly operated before the warning mode.
e) Total operation (power-on) hours indicated by the hour meter when the warning was activated.

The above-mentioned information on the warning can be called by the following procedure.

1) Access the service menu and get "ErCALL" appearing in the counter display. (Refer to 7.2.2)
2) Press the SET button on the front panel and such the last warning code as the following will appear in the counter display.

3) Press the OUT/-SHIFT button on the front panel repeatedly and the detailed information on the last warning mode will appear in the counter display one after another.

4) To access the data of older warnings, press the IN/+SHIFT button once to access the warning preceding the last one, press it again to access the thirdly old warning, and do it once more to access the fourthly old warning.



Warning code
(0801 : Abnormal supply tension)

Mode when the warning was activated. (83C2 : Shuttle +11 mode)

Mode preceding the mode in which the warning was activated.
(0500 : Play mode)

Lastly pressed operation button before the warning mode.
(88C2 : Shuttle+11 key)

Hours when the warning was activated.

Indicates data .
Indicates kind of data.
E ;ERROR DATA
(refer to 7.3.2)
C ;CURRENT MODE
(refer to Table 7-2-2)
b ;BEFORE MODE
(refer to Table 7-2-2)
S ;SWITCH
(refer to Table 7-2-3)
H ;HOUR METER
Indicates the order of warning counted backwards from the last warning.

CMD	MODE	REMARK
02 –	STILL	
05 –	PLAY	
07 –	NO CASSETTE	
09 –	EJECT	
0B –	STOP-2	UNLOAD END state
0C –	STOP-3	PINCH:OFF, DRUM: OFF
0D –	STOP-4	PINCH: ON,DRUM: ON
0E –	ERROR MODE	
10 –	POWER OFF	
13 –	SKIP FWD	Leader tape skipping in the Full-loading End state.
14 –	SKIP REV	
17 –	SLOW FF	Reel Search at 33X or 17X speed, or FF/REW (pinch roller off) near the end or
18 –	SLOW REW	
19 –	FAST FF	Reel Search at 100X speed.
1A –	FAST REW	
1B –	SHORT FF	Leader tape skipping in the Unloading End state.
1C –	SHORT REW	
80 **	REC	Including 1 byte data. *1
81 **	ASSM EDIT	Including 1 byte data. *2
83 **	SHUTTLE (+)	Including speed data. *3
84 **	JOG (+)	Including speed data. *3
85 **	VARIABLE (+)	Including speed data. *3
86 **	PLAY(+)	Including speed data. *4
90 **	AUDIO DUB	Including 1 byte data. *5
91 **	INSERT EDIT	Including 1 byte data. *6
93 **	SHUTTLE (–)	Including speed data. *3
94 **	JOG (–)	Including speed data. *3
95 **	VARIABLE (–)	Including speed data. *3
96 **	PLAY (–)	Including speed data. *4
B3 **	INTAKE	Including data to indicate the next mode. *7
B4 **	HALF LOAD	
B5 **	HALF UNLOAD	
B6 **	LOAD	
B7 **	UNLOAD	

Table 7-2-2 Mode data

CMD	KEY	REMARK
30 00	EJECT KEY	
31 00	STOP KEY	
32 00	FF KEY	
33 00	REW KEY	
34 00	STILL KEY	
37 00	EDIT KEY	
38 00	EDIT STOP KEY	
40 00	PLAY KEY	
41 00	REC+PLAY KEY	
42 00	REC+PAUSE KEY	
43 00	A.DUB+PLAY KEY	
44 00	A.DUB+STILL KEY	
45 00	STAND-BY KEY	
50 00	POWER ON KEY	
60 00	POWER OFF KEY	
87 **	EE ON KEY	Containing data to select EE signal. *8
88 **	SHTL(+) KEY	Containing speed data. *3
89 **	JOG(+) KEY	Containing speed data. *3
8A **	VAR SRH(+) KEY	Containing speed data. *3
8B **	PLAY(+) KEY	Containing speed data. *4
97 **	EE OFF KEY	Containing data to select EE signal. *8
98 **	SHTL(–) KEY	Containing speed data. *3
99 **	JOG(–) KEY	Containing speed data. *3
9A **	VAR SRH(–) KEY	Containing speed data. *3
9B **	PLAY(–) KEY	Containing speed data. *4

Table 7-2-3 Key data

Data added to mode commands

*1 Detailed status of REC mode is shown by the data 0.
<Data 0>

MSD				LSD			
7	6	5	4	3	2	1	0
			REC		REC PLAY	REC PAUSE	BACK SPACE

*2 Detailed status of ASSEM mode is shown by the data 0.
<Data 0>

MSD				LSD			
7	6	5	4	3	2	1	0
			ASSEM		EDIT PLAY	EDIT STILL	PRE-ROLL

*3 Tape speed is expressed by the data 0 in the following equation.

$$\text{TAPE SPEED} = 10^{\frac{\text{DATA0 [DEC]}}{64} - 2}$$

*4 Tape speed is expressed by the data 0 in the following equation.

$$\text{TAPE SPEED} = 1 \times (1 + 0.001 \times \text{DATA0 [DEC]})$$

*5 Detailed status of AUDIO DUB mode is shown by data 0.
<Data 0>

MSD				LSD			
7	6	5	4	3	2	1	0
			AUDIO DUB				PAUSE

*6 Detailed status of INSERT mode is shown by data 0.
<Data 0>

MSD				LSD			
7	6	5	4	3	2	1	0
			INSERT		EDIT PLAY	EDIT STILL	PRE-ROLL

*7 Although the next mode is indicated by the data 0 and data 1 in this command, the counter display shows the detail of the data 0 only.
<Data 0 >

MSD				LSD			
7	6	5	4	3	2	1	0
	REW	FF	STOP	REC PLAY	REC STILL		EJECT

<Data 1 > This data is not shown in the counter display.

MSD				LSD			
7	6	5	4	3	2	1	0
REV	FWD	STILL	PLAY		SHTL REV	SHTL STILL	SHTL FWD

*8 In this command the data 0 indicates the signal line to be used for EE operation.
<Data 0>

MSD				LSD			
7	6	5	4	3	2	1	0
			SELECT				FULL

7.3 WARNING DETECTION CIRCUIT

7.3.1 Outline

If there occurs something abnormal in operation, this set diagnose the cause by itself and stops the operation automatically.

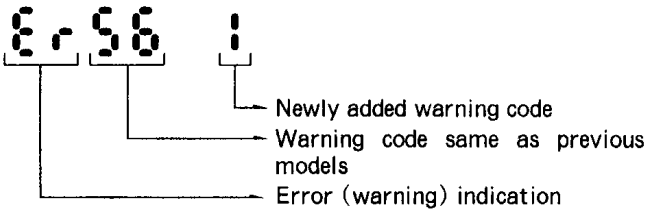
This operation is named the warning mode, which indicates the kind of the abnormal operation in the counter display on the front panel and in the Video Monitor Out signal.

Note: When the menu No. 303 'WARNING ENABLE' is set to OFF (01), the set does not enter the warning mode.

When the set enters the AUTO OFF mode, the set can be recovered from the mode only by turning off the main switch once and turning it on again.

Although such the operation as mentioned above is carried out in previous models, this model is improved in diagnosing speed with the newly added functions of the following.

1) Warning code displayed in three figures
Compared with the display in two figures for previous models, this set indicates more detailed data of the warning with an additional digit.

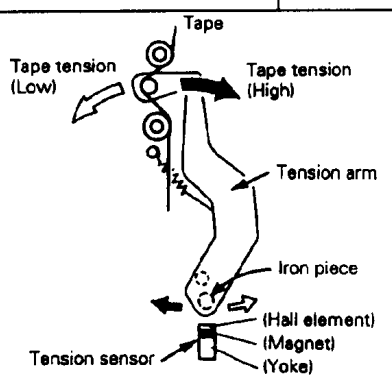


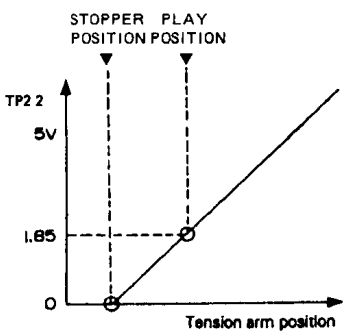
2) Memory of warning history
This set stores data of past warning modes in the memory. (Refer to 7.2.3(8) 'Calling procedure of warning history'.)

7.3.2 Table of warning codes

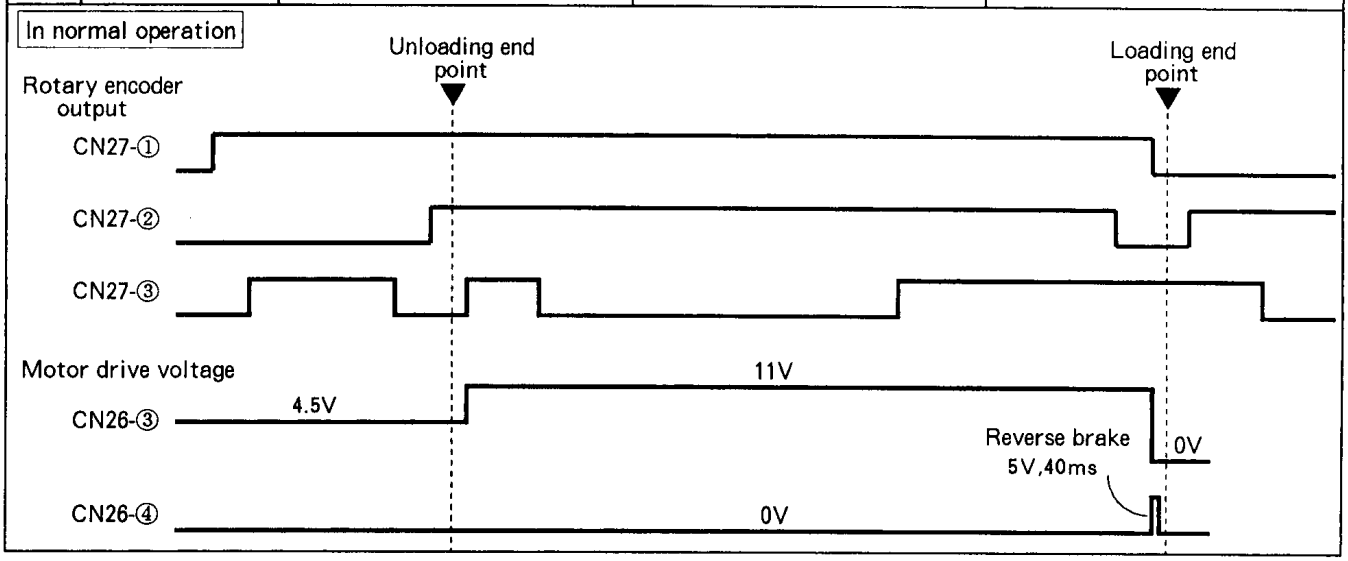
Symbol No. . indicates part on the SERVO/M-CTL board unless otherwise indicated.

Code No.	Sensor	Detection manner	Operation	Countermeasure
01: Breakdown or disconnection of LED for leader tape detection				
01 01	Q22	When level of pin 38 of IC21 becomes High level for 240 ms or longer. **Normal level of pin 38 of IC21 is 0 V.**	AUTO OFF	Replace the LED.
02: Condensation on drum				
02 01	Dew sensor (IC14pin75) Characteristic of dew sensor Relative humidity / Resistance value 75% / 20kΩ and less 100% / 200kΩ and more	When level of pin 75 of IC14 is 3 V or more. This warning mode is cancelled when level of pin 75 of IC14 becomes 2 V or less. When level of pin 75 of IC14 is 2 V to 3 V at the moment of power on, the set enters this warning mode if the last power-off was operated as the set was in the warning 02 mode. **Normal level of pin 75 of IC14 is 2 V or less.**	The drum motor automatically runs after the cassette is ejected. As the set is released from the dewed condition, the warning mode is cancelled and the set comes back to the normal operation mode. In the dewed condition, no cassette tape can be loaded.	If the warning mode is not cancelled, it may result from trouble of the dew sensor.
08: Abnormal supply tension				
08 01	Tension sensor (TP22 or IC14pin72)	When level of pin 72 of IC14 is less than 0.2 V for 500 ms as the mechanism is in the loading end state (except in the standby off mode). **Normal voltage at TP22 is as follows:** **In play mode : 1.85 V ±0.10V** **In standby off mode: 0^{+81}_{-0} V.**	AUTO OFF	Abnormal tension servo. Maladjustment of R214, R222. (This case needs adjustment of each torque of playing, loading and reversing.) Faulty reel motor. Trouble in the tape transport system.

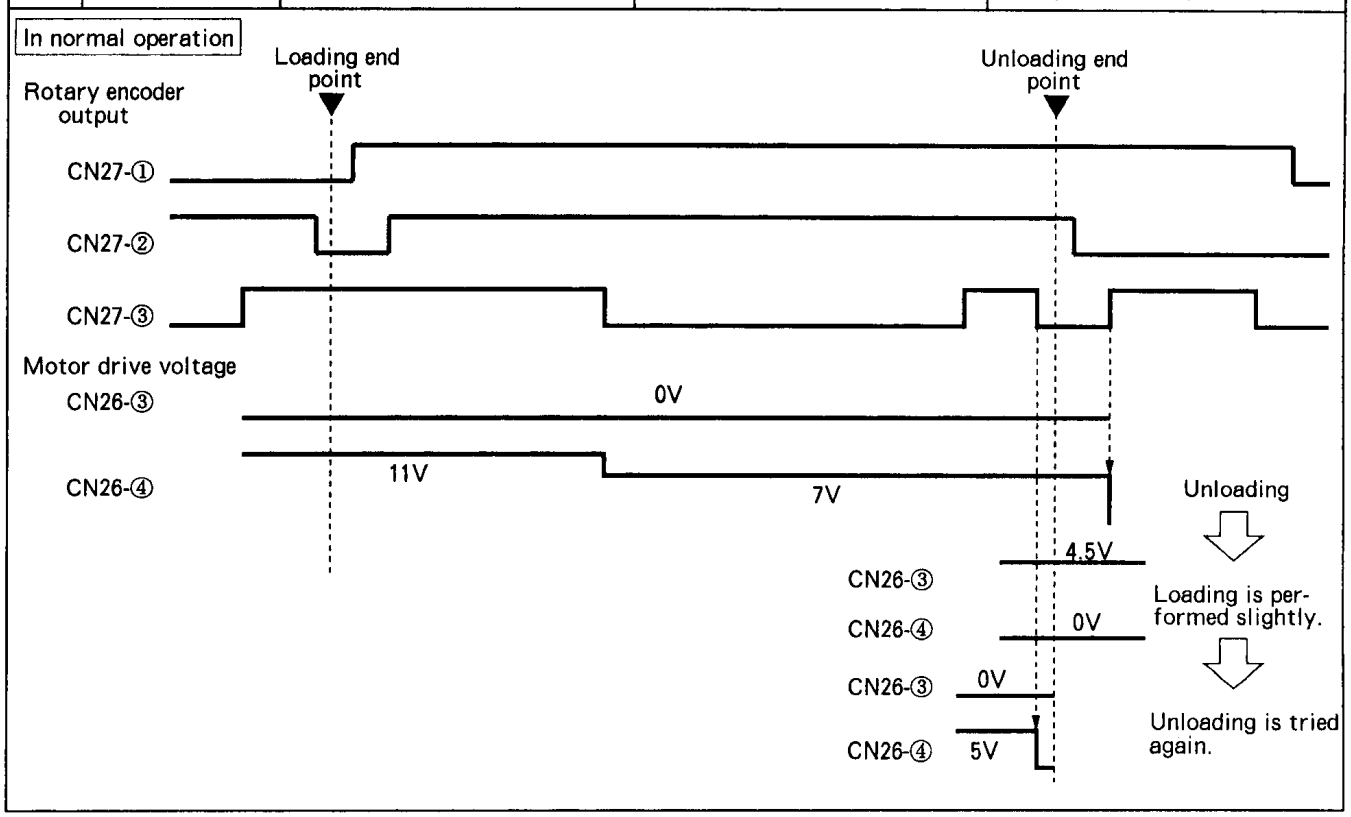




Code No.	Sensor	Detection manner	Operation	Countermeasure
32: Loading is not carried out.				
32 01	Rotary encoder (CN27-①②③)	When loading does not finish within 8 sec after it starts.	Loading is cancelled and unloading is executed. Then, loading will be tried again. If the loading for the second time fails, too, the cassette tape is ejected.	Fault in rotary encoder. Fault in loading motor. Fault in IC33 MDA (TA8405S). Trouble in the loading mechanism. Faulty cassette tape.



Code No.	Sensor	Detection manner	Operation	Countermeasure
33: Unloading is not carried out.				
33 01	Rotary encoder (CN27-①②③)	When unloading does not finish within 8 sec after it starts.	Unloading is cancelled and loading is executed. Then, unloading will be tried again. If the unloading for the second time fails, too, the set enters the AUTO OFF warning mode.	Fault in rotary encoder. Fault in loading motor. Fault in IC33 MDA (TA8405S). Trouble in the loading mechanism. Faulty cassette tape.

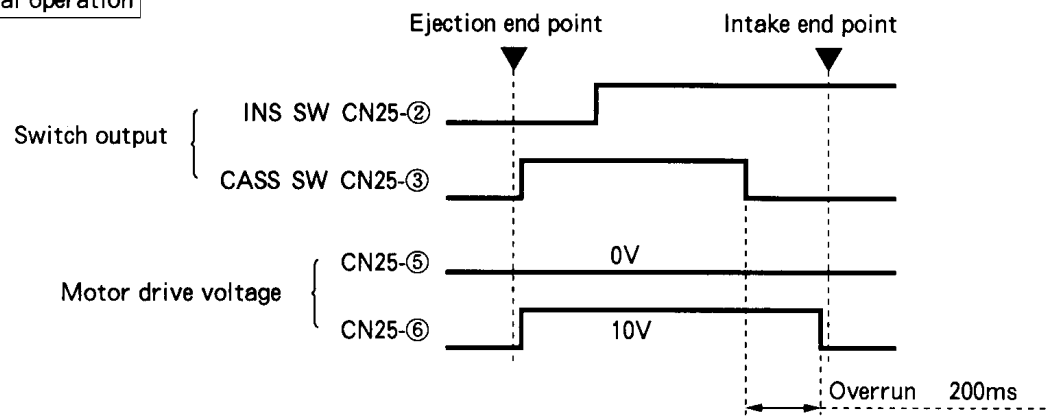


Code No.	Sensor	Detection manner	Operation	Countermeasure

Intake operation is not completed. (No warning indication)

– –	Cassette switch (CN25-③) Insert switch (CN25-②)	When cassette tape intake operation does not finish within 3 sec.	Cassette tape is ejected. No warning indication is displayed.	Fault in cassette housing. Fault in IC33 MDA (TA8405S). Fault in cassette or insert switch. Faulty cassette tape. Abnormal orientation of LED for leader tape detection.

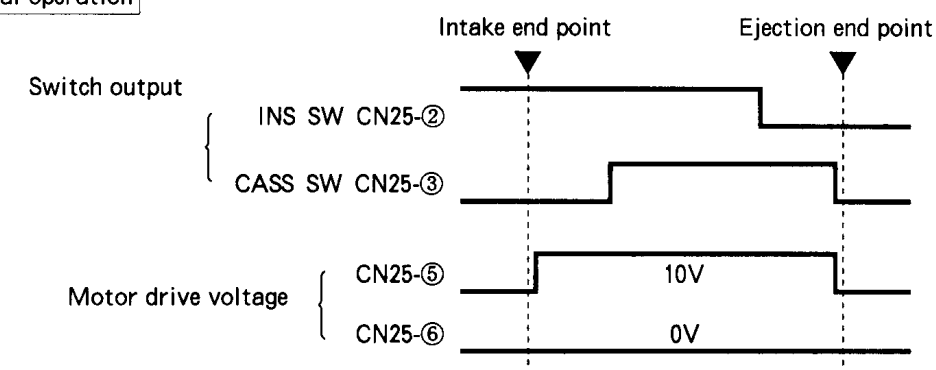
In normal operation



41: Ejection is not completed.

41 01	Cassette switch (CN25-③) Insert switch (CN25-②)	When cassette ejection operation does not finish within 3 sec.	Ejection operation is once cancelled and the cassette tape is taken in again. Then, ejection operation is tried once more. If the ejection operation for the second time fails, the set enters the AUTO OFF warning mode.	Fault in cassette housing. Fault in IC33 MDA (TA8405S). Fault in cassette or insert switch. Faulty cassette tape.

In normal operation

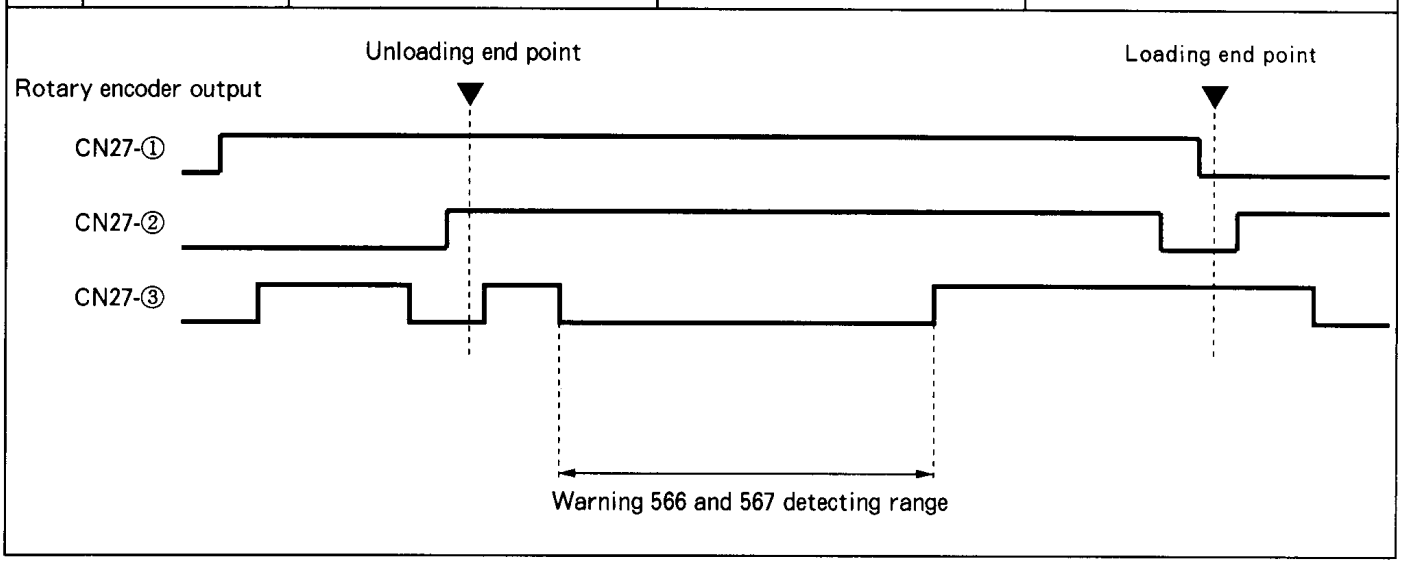


Symbol No. . indicates part on the SERVO/M-CTL board unless otherwise indicated.

Code No.	Sensor	Detection manner	Operation	Countermeasure

56: Tape breaking

56 01 56 02	SUP. reel FG (IC14pin63) TU. reel FG (IC14pin62)	When reel reversely runs for 3 cm and more in tape length in the Short FF/REW or Skip FWD/REV mode.	Cassette tape is ejected.	Trouble in reel servo circuit. Faulty wiring between reel motor and SERVO/M-CTL board.
56 03 56 04	SUP. reel FG (IC14pin63) TU. reel FG (IC14pin62)	When there are more than 40 REEL FG pulses output for the reason that reel motor runs at a high speed exceeding the specified limit with a cassette tape being inserted. Specified speed limit is: When pinch roller is on : 11X speed x 1.1 When pinch roller is off : 140X speed x 1.1. The above limits are determined by calculation of diameter of tape winding and REEL FG pulses.	Cassette tape is ejected.	Trouble in reel servo circuit. Faulty wiring between reel motor and SERVO/M-CTL board.
56 05	Tape beginning sensor (IC21pin37) Tape end sensor (IC21pin36)	When both of tape end and tape beginning are detected for 500 ms or longer in a mode other than loading and unloading at the same time with a cassette tape being inserted. **Each sensor output is 3.5 V or more in normal operation.**	Cassette tape is ejected.	Trouble in tape beginning sensor and tape end sensor. Abnormal orientation of LED for leader tape detection.
56 06	SUP. reel FG (IC14pin63)	When supply reel turns around 7 times or more in unloading mode. (A turning around of supply reel outputs 120 SUP REEL FG pulses.)	Cassette tape is ejected.	Trouble in reel servo circuit. Faulty wiring between reel motor and SERVO/M-CTL board.
56 07	SUP. reel FG (IC14pin63)	When supply reel turns around 5 times or more in loading mode. (A turning around of supply reel outputs 120 SUP REEL FG pulses.)	Cassette tape is ejected.	Trouble in reel servo circuit. Faulty wiring between reel motor and SERVO/M-CTL board.



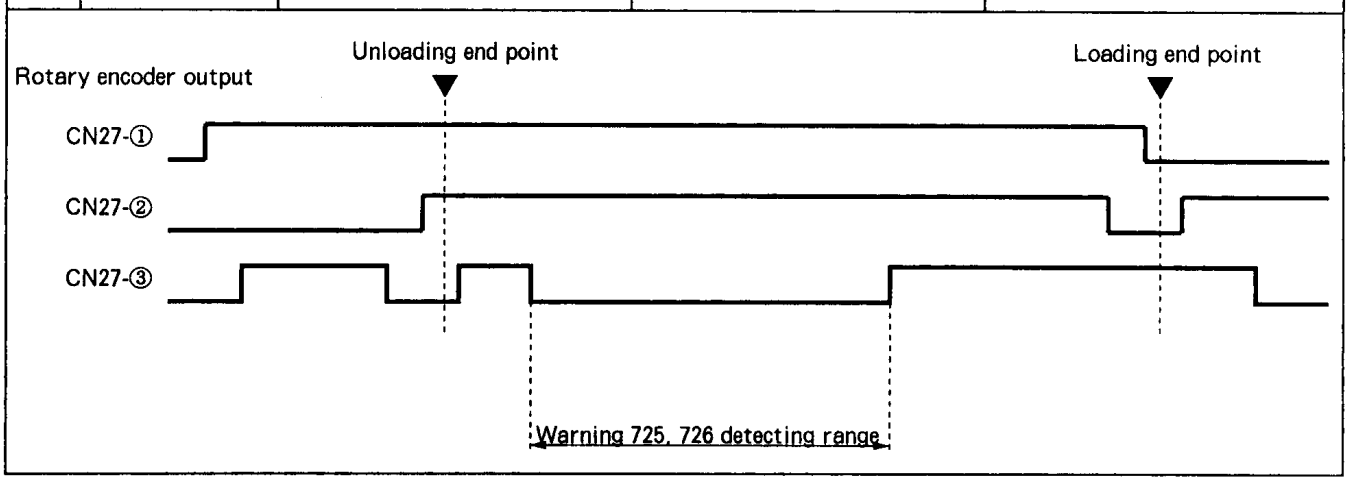
Symbol No. . indicates part on the SERVO/M-CTL board unless otherwise indicated.

Code No.	Sensor	Detection manner	Operation	Countermeasure
57: Tape end detection				
57 01	Tape end sensor (CN21-④)	When leader tape is not pulled into cassette within 3 sec in Short REW mode. **Tape end sensor output in normal operation is:** **with main portion of tape : 3.5 V or more,** **with leader portion of tape : 1.5 V or less.**	Cassette tape is ejected. Insert cassette tape again, and the warning display is turned out.	Trouble in reel servo circuit. Fault in tape end sensor. Abnormal orientation of LED for leader tape detection. Faulty cassette tape.
57 02	Tape end sensor (CN21-④)	When leader tape is not pulled into cassette within 3 sec in Skip REV mode.		
58: Tape beginning detection				
58 01	Tape beginning sensor (CN25-④)	When leader tape is not pulled into cassette within 3 sec in Short FF mode. **Tape beginning sensor output in normal operation is:** **with main portion of tape : 3.5 V or more,** **with leader portion of tape : 1.5 V or less.**	Cassette tape is ejected. Insert cassette tape again, and the warning display is turned out.	Trouble in reel servo circuit. Fault in tape begining sensor. Abnormal orientation of LED for leader tape detection. Faulty cassette tape.
58 02	Tape beginning sensor (CN25-④)	When leader tape is not pulled into cassette within 3 sec in Skip FWD mode.		
70: Drum motor is abnormal.				
70 01	DRUM FG (IC14pin65)	DRUM FG pulse is not output for 2 sec or more in a mode that drum motor should be running.	AUTO OFF	Fault in wiring between drum motor and SERVO/M-CTL board. Trouble in drum servo circuit. Faulty drum motor.
71: Capstan motor is abnormal.				
71 01	CAPSTAN FG (IC14pin64)	CAPSTAN FG pulse is not output for 1 sec or more in PLAY, CAP SEARCH or REC mode.	AUTO OFF	Fault in wiring between capstan motor and SERVO/M-CTL board. Trouble in capstan servo circuit. Faulty capstan motor.

Code No.	Sensor	Detection manner	Operation	Countermeasure

72:Supply reel motor is abnormal.

72 01	SUP REEL FG (IC14pin63) CAPSTAN FG (IC14pin64)	Tape slackening When supply reel does not rotate nevertheless capstan motor is running. (When ratio of SUP REEL FG pulse to CAPSTAN FG pulse is 0 to 3072 or more in number.)	AUTO OFF	Trouble in reel servo circuit. Fault in wiring between reel motor and SERVO/M-CTL board. Faulty reel motor.
72 02	SUP REEL FG (IC14pin63)	Reel locking When no SUP REEL FG pulse is output in a specific period of time (4 sec to 12 sec) determined by diameter of tape winding.	AUTO OFF	Trouble in reel servo circuit. Fault in wiring between reel motor and SERVO/M-CTL board. Faulty reel motor.
72 03	SUP REEL FG (IC14pin63)	Reel rotating reversely When reel turns reversely for 3 cm in tape length in a mode other than Short FF/REW, Skip FWD/REV. (Tape travel distance to be converted into period is determined by calculation of diameter of tape winding and number of REEL FG pulses.)	AUTO OFF	Trouble in reel servo circuit. Fault in wiring between reel motor and SERVO/M-CTL board. Faulty reel motor.
72 04	SUP REEL FG (IC14pin63)	Reel overrunning When reel motor runs at a high speed exceeding the specific limit (154X speed) without cassette being inserted and more than 40 SUP REEL FG pulses are output a second.	AUTO OFF	Trouble in reel servo circuit. Fault in wiring between reel motor and SERVO/M-CTL board. Faulty reel motor.
72 05	SUP REEL FG (IC14pin63)	Abnormal reel rotation in unloading mode When supply reel turns only half around or less in unloading mode. (120 SUP REEL FG pulses are output a turning around of supply reel.)	AUTO OFF	Trouble in reel servo circuit. Fault in wiring between reel motor and SERVO/M-CTL board. Faulty reel motor.
72 06	SUP REEL FG (IC14pin63)	Abnormal reel rotation in loading mode When supply reel turns only half around or less in loading mode. (120 SUP REEL FG pulses are output a turning around of supply reel.)	AUTO OFF	Trouble in reel servo circuit. Fault in wiring between reel motor and SERVO/M-CTL board. Faulty reel motor.



Code No.	Sensor	Detection manner	Operation	Countermeasure
73:Take-up reel motor is abnormal				
73 01	CAPSTAN FG (IC14pin64) TU REEL FG (IC14pin62)	Tape slackening When take-up reel does not rotate nevertheless capstan motor is running. (When ratio of TU REEL FG pulse to CAPSTAN FG pulse is 0 to 3072 or more in number.)	AUTO OFF	Trouble in reel servo circuit. Fault in wiring between reel motor and SERVO/M-CTL board. Faulty reel motor.
73 02	TU REEL FG (IC14pin62)	Reel locking When no TU REEL FG pulse is output in a specific period of time (4 sec to 12 sec) determined by diameter of tape winding.	AUTO OFF	Trouble in reel servo circuit. Fault in wiring between reel motor and SERVO/M-CTL board. Faulty reel motor.
73 03	TU REEL FG (IC14pin62)	Reel rotating reversely When reel turns reversely for 3 cm in tape length in a mode other than Short FF/REW, Skip FWD/REV.	AUTO OFF	Trouble in reel servo circuit. Fault in wiring between reel motor and SERVO/M-CTL board. Faulty reel motor.
73 04	TU REEL FG (IC14pin62)	Reel overrunning When reel motor runs at a high speed exceeding the specific limit (154X speed) without cassette being inserted and more than 40 TU REEL FG pulses are output a second.	AUTO OFF	Trouble in reel servo circuit. Fault in wiring between reel motor and SERVO/M-CTL board. Faulty reel motor.
73 05	TU REEL FG (IC14pin62)	No detection of tape winding diameter When take-up reel does not turn a quarter round within 3 sec in the mode to detect tape winding diameter just after intake of cassette tape.	AUTO OFF	Trouble in reel servo circuit. Fault in wiring between reel motor and SERVO/M-CTL board. Faulty reel motor. Trouble in mechanism.

Explanation of technical terms

1.Skip FWD:
As the tape beginning is detected in the REW and Search REV modes, the tape is automatically fast forwarded (at 2X speed) to pull the leader tape into the cassette. The condition of this operation is called the Skip FWD mode.

2.Skip REV:
As the tape end is detected in the FF, Search FWD and Play modes, the tape is automatically rewound (at 2X speed) to pull the leader tape into the cassette. The condition of this operation is called the Skip REV mode.

3.Short FF:
When the tape beginning is detected just after intake of a cassette tape, the mechanism automatically fast forwards the tape (at 5X speed) to pull the leader tape into the cassette as the mechanism is in the unloading end state. The condition of this operation is called the Short FF mode.

4.Short REW:
When the tape end is detected just after intake of a cassette tape, the mechanism automatically rewinds the tape (at 5X speed) to pull the leader tape into the cassette as the mechanism is in the unloading end state. The condition of this operation is called the Short REW mode.

5.Detection of tape winding diamter:
With intake of a cassette tape, this set detects the diameter of tape winding on the supply reel before the mode is shifted to the loading mode. According to detection result, the revolution torque of the supply reel motor for loading is changed to control the tape tension properply to the current tape winding.

(1) The take-up reel motor is turned a quarter round in the FWD direction. ⇒ Revolution of the supply reel during this operation is measured in number.
(2) The tape is taken in the slack.
(3) The supply reel motor is turned in the REV direction to turn the take-up reel a quarter round. ⇒ Revolution of the supply reel during this operation is measured in number.
(4) The higher of two revolutions of the supply reel measured in the above steps (1) and (3) is compared with the revolution (1/4 turn) of the take-up reel to find the ratio between them, and the diameter of tape winding at that time is roughly detected.

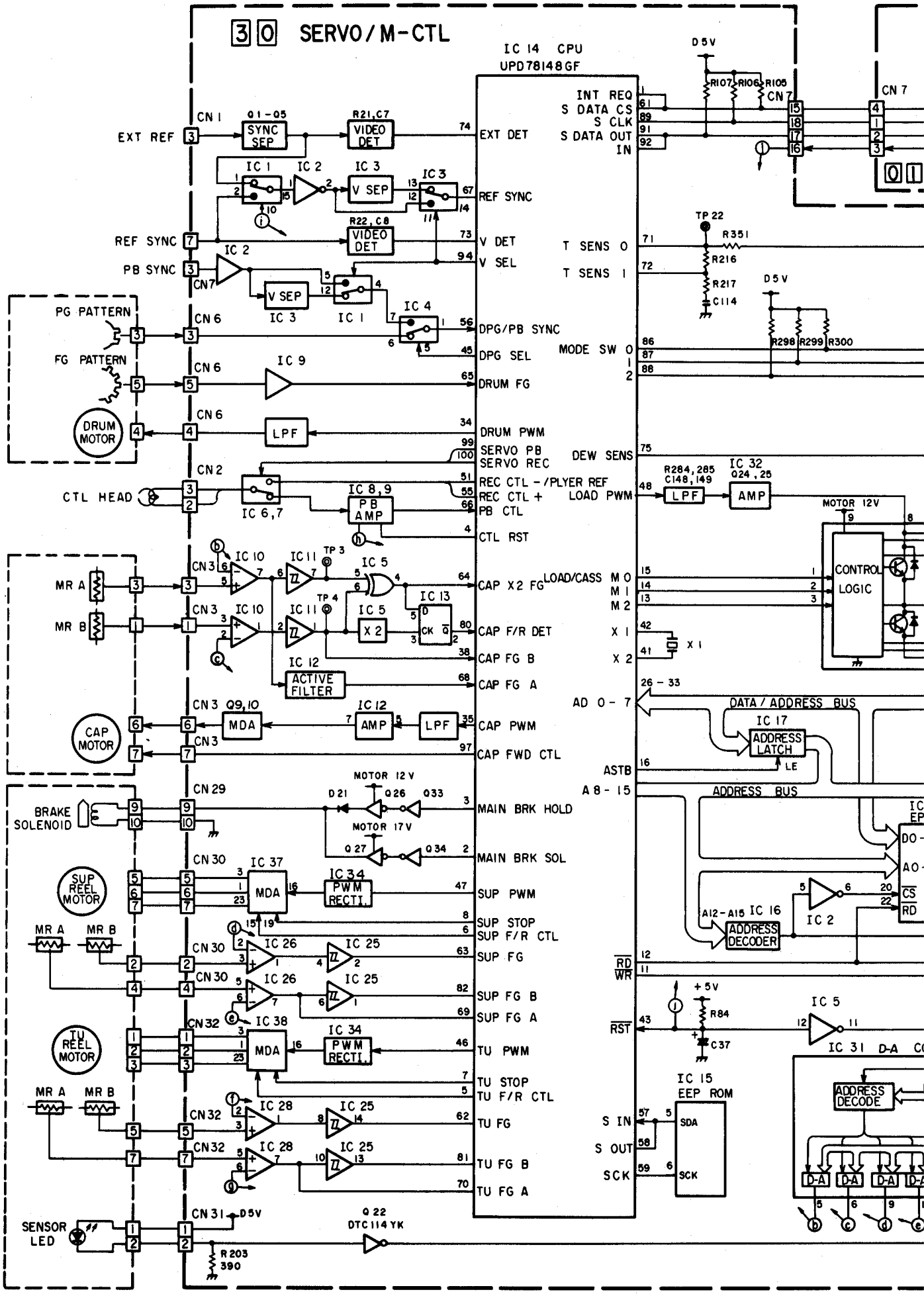
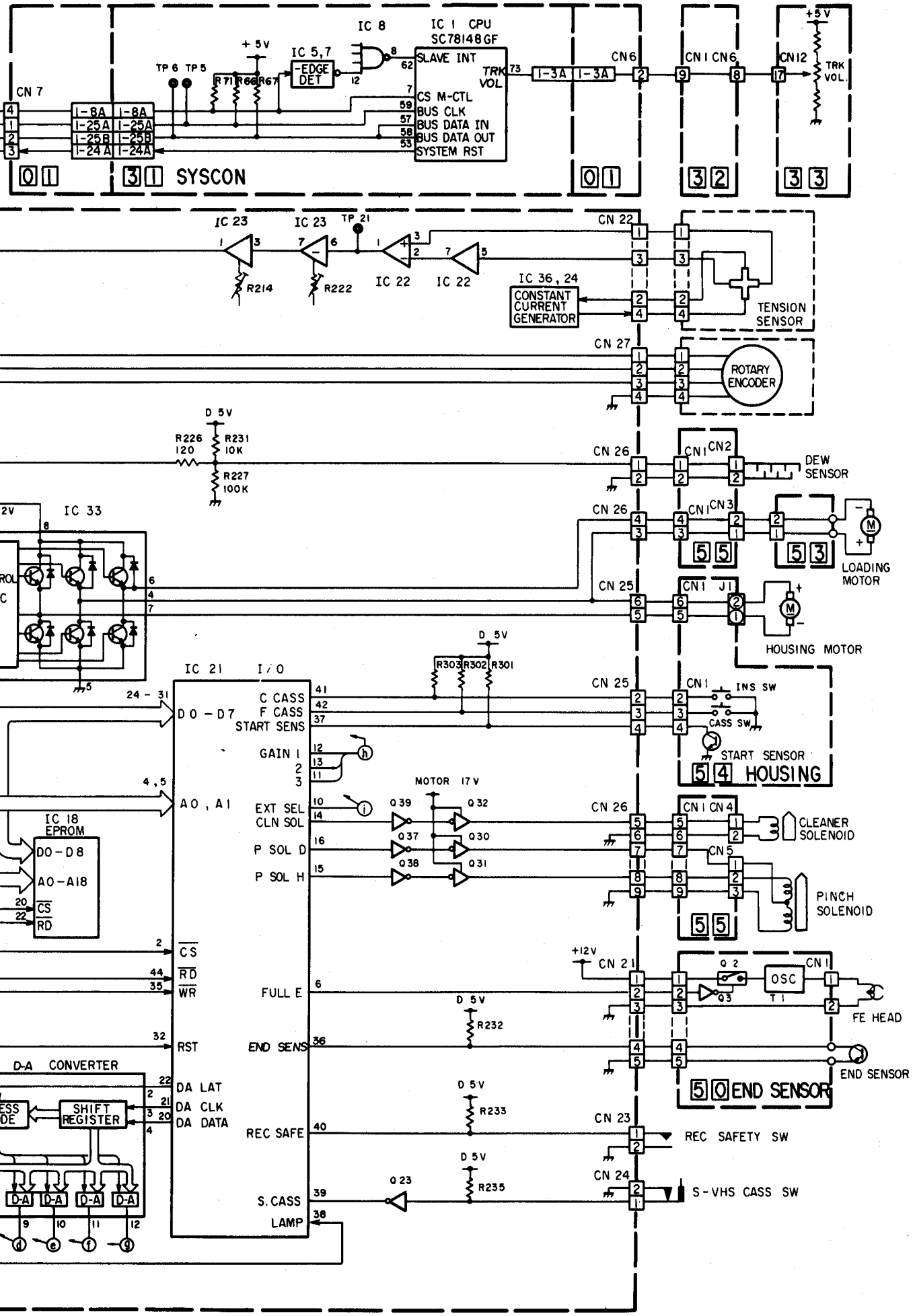


Fig. 7-3-1 M-CTL circui



TL circuit block diagram

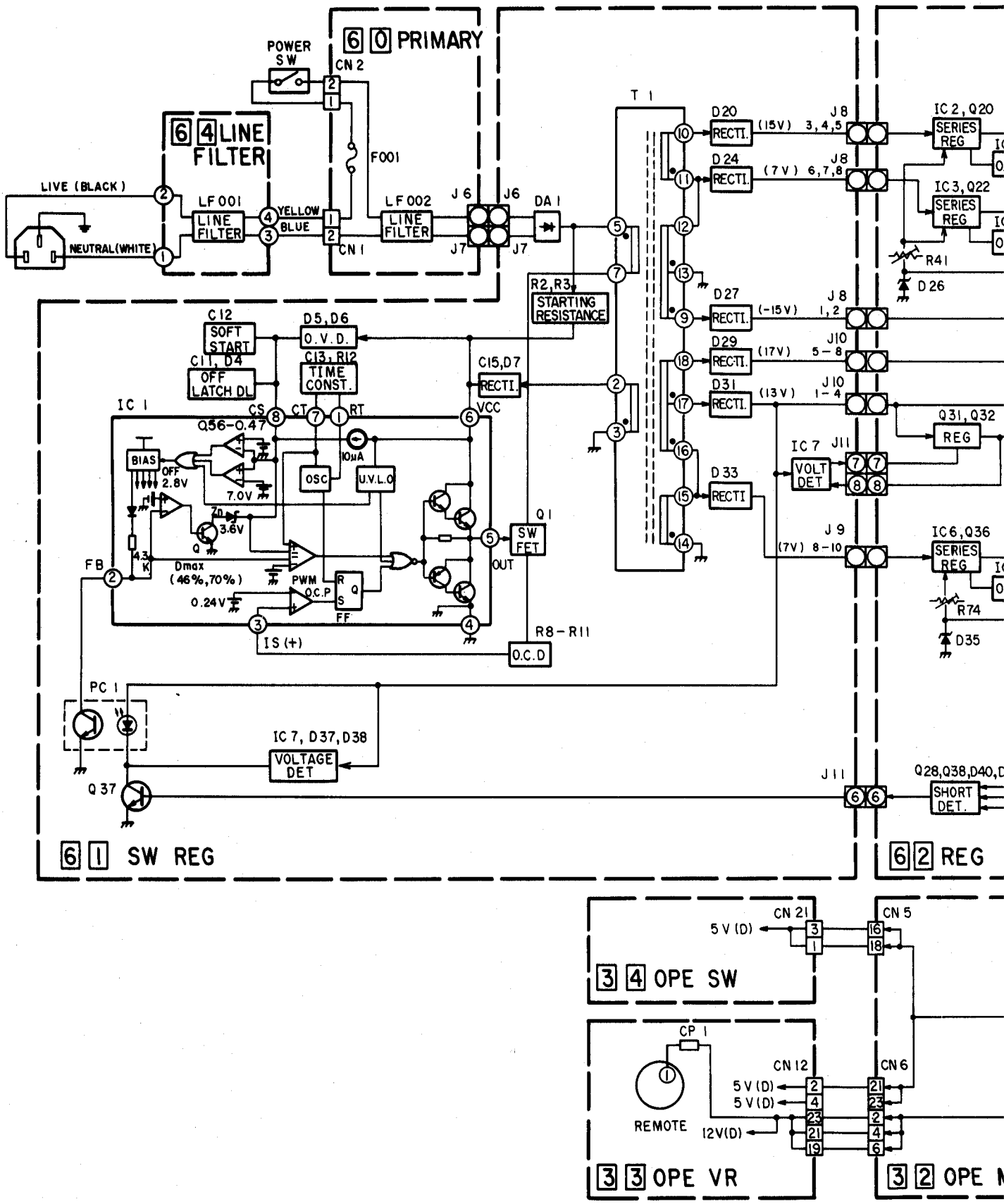
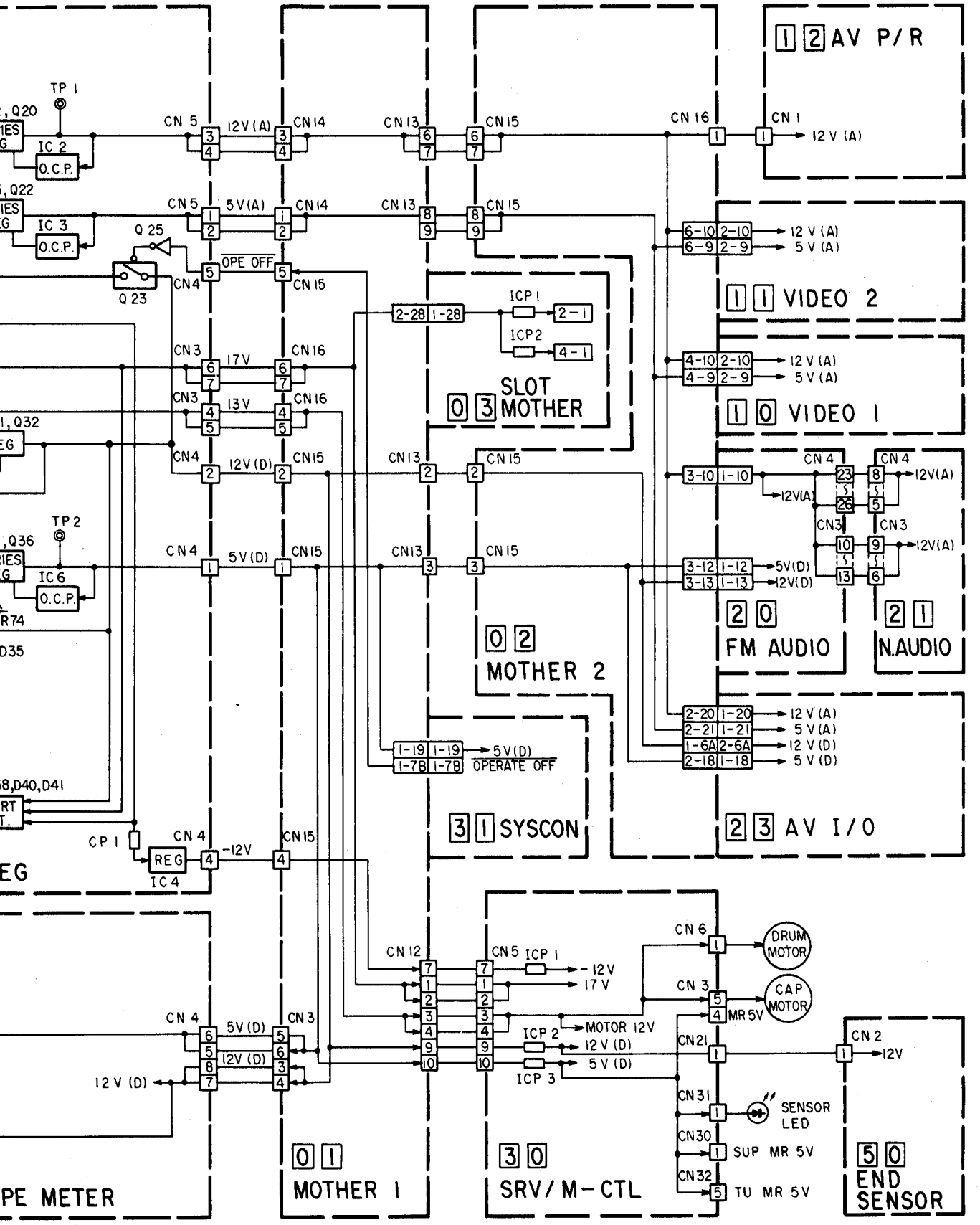


Fig. 7-4-1 Block diagram of Po



of Power supply circuit

7.4 POWER SUPPLY CIRCUIT

7.4.1 Operation of switching circuit

Switching power is controlled by IC1 (FA5311P). In detail, as IC1 turns on the switching MOS FET Q1, current flows into the primary coil of the transformer T1. At that time, current does not flow to the secondary coil of T1 since voltage at the secondary coil is applied to the rectifier circuit (D20, D24, D29, D31, D33) in the reverse direction (D27 is supplied with current).
Next, IC1 turns off Q1 and the primary coil resultantly generates counter electromotive force, then current flows to the rectifier circuit of the secondary side to maintain the same ampere return as Q1 is on.

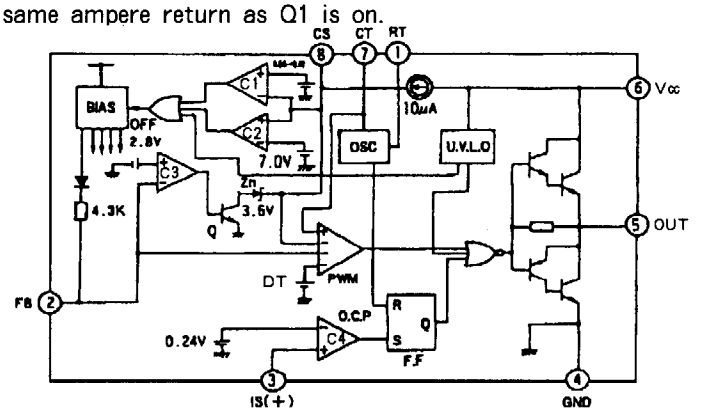


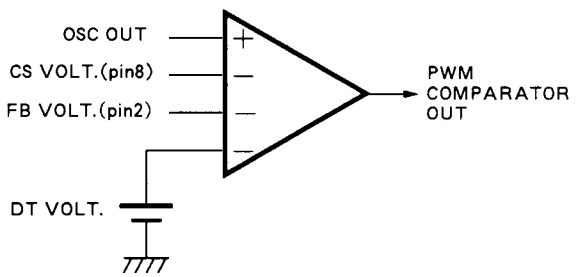
Fig.7-4-1 FA5311P Block diagram

7.4.2 IC1 FA5311P

(1) Oscillation frequency

$$f\,[kHz] = \frac{10}{4 \times R_T\,[k\Omega] \times C_T\,[pF]} \fallingdotseq 65\,[kHz]$$

(2) PWM comparator



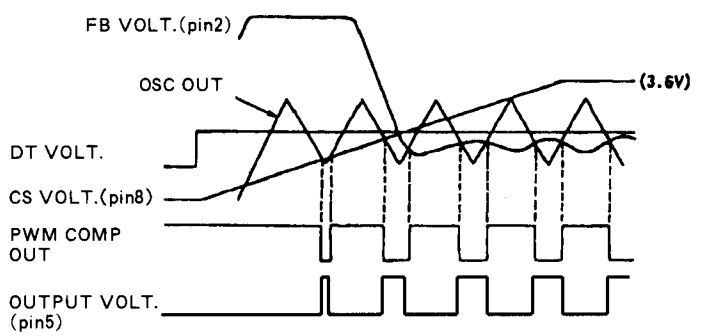


Fig.7-4-2 PWM Comparator

The PWM comparator compares the lowest voltage among CS terminal voltage, FB terminal voltage and DT voltage with the oscillator output.
DT voltage for regulating the maximum duty cycle is set to a voltage with which the maximum duty ratio is set at 70 %.

(3) Soft start

When the power is supplied to the set, the constant-current regulated power (10 μA) supply circuit inside IC1 starts charging to C12 that is externally attached to the CS terminal. Therefore, CS terminal voltage gradually goes up, and the output pulse width is accordingly widened to actuate the set with soft start.

(4) Power cutoff function in case of overload

When output voltage drops down for the reason of overload and shortcircuit, etc., FB terminal voltage goes up. If FB terminal voltage exceeds 2.8 V, output of the comparator C3 becomes low and the zener diode is unclamped in the IC. As a result, C12 to activate soft start is charged again and CS terminal voltage goes up, too. If this voltage exceeds 7 V, output of the internal comparator C2 becomes high and the bias circuit is turned off. Therefore, IC1 enters the off-latch mode and cuts off the output.
The above condition is canceled when the supply voltage (Vcc) is regulated under 8.7 V.

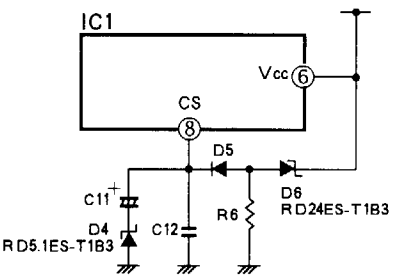


Fig. 7-4-3 External circuit of CS terminal

D4 and C11 that are externally attached to the CS terminal compose a circuit to delay the time to enter the IC into the off-latch mode.
When CS terminal voltage goes up nearly to 5 V, D4 is turned on and C11 is charged, therefore, CS terminal voltage gradually goes up. This operation avoids undesirable action of the power cutoff function such as in momentary overload resulting from turning on of the solenoid.

(5) Over-voltage interrupting function

When Vcc of IC1 exceeds 24 V, CS terminal voltage goes up by the function of the zener diode D6. If this voltage exceeds 7V, the power supply cutoff function is activated as well as the case of overload.

(6) Malfunction prevention circuit against low supply voltage (U.L.V.O.)

To prevent malfunction caused by low supply voltage, IC1 internally employs the malfunction prevention circuit against low supply voltage. When the supply voltage is raised from 0V, IC1 starts operation with 16 V of Vcc, on the other hand, when the supply voltage is dropped down, it is activated to cut off output with 8.7 V of Vcc.
When this circuit is activated once, turn down the level of the CS terminal to reset the circuit.

(7) Over-current protector circuit

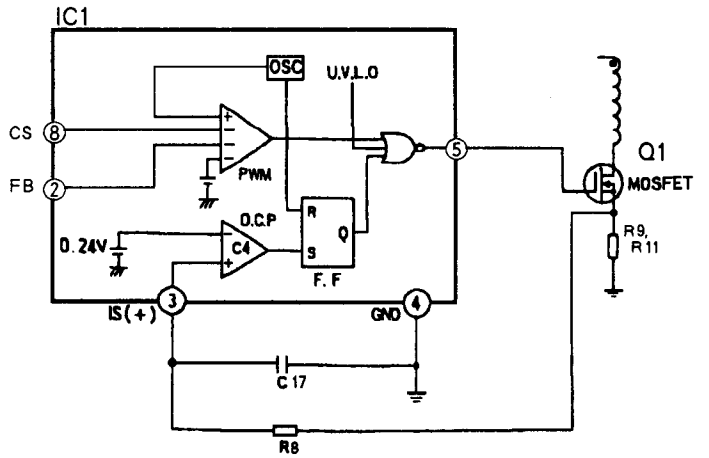


Fig.7-4-4 Over current protector circuit

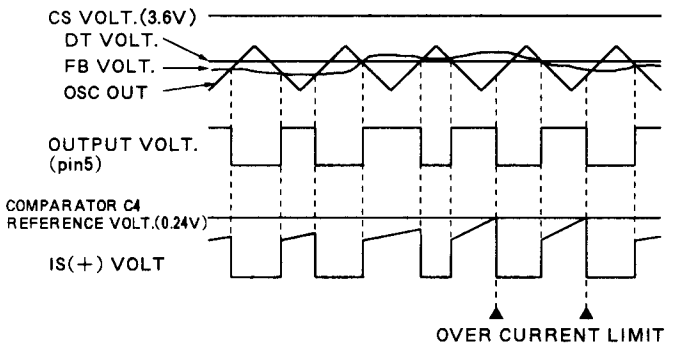


Fig.7-4-5 Over current protector timing chart

The over-current protector circuit is a pulse-by-pulse type circuit which detects peak level of drain current of Q1, the switch MOS FET, at every pulse output.
The circuit consisting of R9 and R11 converts drain current of Q1 into voltage signal, which is supplied to the IS terminal of IC1. If this voltage exceeds the reference voltage of the comparator C4 inside IC1, C4 outputs high level signal to set the flip-flop circuit. Accordingly, IC1 cut off the output to interrupt the over-current.
The flip-flop circuit again starts operation to be reset in the next cycle of OSC output.

7.5 AUTOMATIC ADJUSTMENT FUNCTIONS

7.5.1 Outline

This model reduces adjustment items in number because adjustments of the audio and servo systems are partially automatized.
Adjustment items automatized in this model are shown below.

Servo system
① Adjustment of REEL FG duty ratio
② Adjustment of CAP FG duty ratio
③ Adjustment of stop servo (CAP FG gain adjustment)
④ Adjustment of PB switching point

Audio system
① Adjustment of normal audio PB level
② Adjustment of normal audio PB frequency response
③ Adjustment of Hi-Fi audio PB level
④ Adjustment of normal audio REC level
⑤ Adjustment of normal audio REC frequency response
⑥ Adjustment of EE level

7.5.2 Automatic adjustments for servo system

(1) Operation to start automatic adjustments

FG duty ratio, stop servo adjustment
① Set the adjustment mode to "04".
(a) Turn off the power switch.
(b) Turn on the power switch, and press the COUNTER RESET, FF and REW buttons simultaneously within 2 sec after the counter display is on.
(c) Press the MENU (UP) button or the SET (DOWN) button continually until "04" appears in the counter display.
② Press the IN/+SHIFT or OUT/-SHIFT button.
③ Automatic adjustment starts. Then the mode of the set changes as follows.
(a) Reel motor rotates.
(SUP/TU REEL FG duty ratio automatic adjustment mode)
(b) Capstan motor rotates.
(CAP FG duty ratio automatic adjustment mode)
(c) Step slow mode
(Stop servo automatic adjustment mode)
④ When the above automatic adjustments are completed, "04 End" appears in the counter display.

PB switching point adjustment
① Set the adjustment mode to "0F".
② Play back the MHPE alignment tape.
③ Align the tracking correctly.
④ Press the IN/+SHIFT or OUT/-SHIFT button.
⑤ Automatic adjustment starts. When the automatic adjustment is completed, "0F End" appears in the counter display.

(2) FG duty ratio automatic adjustment circuit

The purpose of FG duty ratio adjustment is to shape feeble output (sine wave) of the MR element installed for detecting rotation speed and rotating direction of each motor to be a rectangular waveform of 50 % duty ratio.
Accordingly, irregularity in the characteristics of MR elements is electrically removed. Therefore, the FG duty ratio adjustment must be performed after either of the capstan motor and reel motor is replaced.
Actually, there are six FG duty ratio adjustment circuits provided in this set since each motor has two built-in MR elements (A, B).
The following explains about the automatic adjustment circuit for CAPSTAN FG A pulse by way of example.

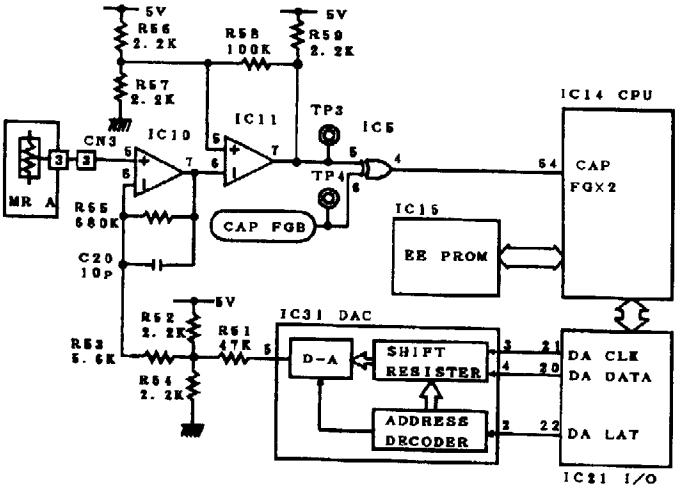
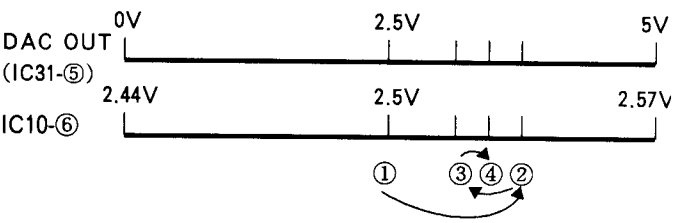


Fig. 7-5-1 FG duty ratio automatic adjustment circuit

Simply explaining the operation, the CPU of IC14 transforms DC voltage output from the D-A converter while measuring the CAPSTAN FG duty ratio. When the duty ratio becomes 50 %, the CPU writes the data in the EEPROM of IC15.

Detailed operation of the CPU IC14 is as follows.
① The CPU starts the capstan motor.
② It regulates the D-A converter output for CAP FG B pulse to 0 V. As a result, there is no CAP FG B output at TP4 and the CPU (pin 64, IC14) is supplied only with CAP FG A pulse.
③ The D-A converter (pin 5, IC31) outputs 2.5 V.
④ The duty ratio at that time is measured. (average of three measurement results)
⑤ If the duty ratio is 40 to 60 %, the CPU commences motor speed control and measures duty ratio again. (average of 768 measurement results)
⑥ According to the lastly measured duty ratio, the CPU decides the voltage to be output from the D-A converter. In detail, the CPU changes the voltage so as to set the duty ratio to 50 % as shown in the figure below.



① Fixed to 2.5 V
② Intermediate voltage between ① and the max. voltage
③ Intermediate voltage between ① and ②
④ Intermediate voltage between ③ and ②

Fig. 7-5-2 Change in output voltage of D-A converter

⑦ The CPU writes the 8th D-A converter output data in the EEPROM IC15.
(If 50 % duty ratio is obtained before the 8th measurement, measurement is suspended and the last data is written in the EEPROM.)

(3) Stop servo automatic adjustment

The stop servo circuit functions to fix the stop point of the capstan motor electrically, and it starts operation as the tape speed is slowed down nearly to 1/10X speed.

Motor drive voltage generated by the CPU during stop servo operation has such a waveform as shown in Fig. 7-5-3, and it is yielded by folding back the CAP FG A pulse at 2.5 V.

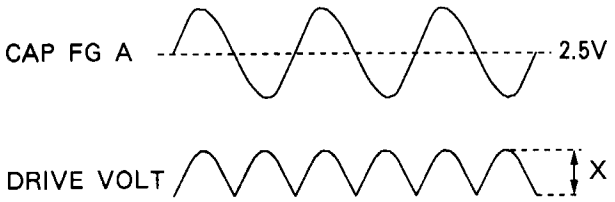


Fig. 7-5-3 Waveform of capstan motor drive voltage

Compared with previous models that needs gain adjustment to make the level X (in the above figure) constant since the level of CAP FG A depends on motor's peculiarity, this model automatically adjusts the gain by the function employed in the CPU.

The CPU first measures input level of FG pulse (at pin 68 of IC14) to make the drive voltage constant in stop servo operation.
For this level measurement, the motor is required to run at a 1/100X speed approximately for yielding CAP FG pulse without distortion.
However, this is a theoretical requirement and it is impossible in practical operation.
Therefore, this model utilizes the step slow mode for FG level measurement and measures FG level just before the tape running is stopped.
According to the mean FG level (average of 24 measurement results), the CPU calculates a constant to output drive voltage at a specific level and writes it in the EEPROM.

(4) PB switching point automatic adjustment

PB switching point adjustment is necessary for correct change of DRUM FF polarity that is used as information of video head position.

Since DRUM FF signal is obtained by delaying DRUM PG signal, the PB switching point adjustment changes the delay time so that the polarity of DRUM FF changes 6.5 H before V. sync as the MHPE alignment tape is played back. This model automatizes this adjustment by the CPU.

① The CPU IC14 inputs DRUM PG, PB V. SYNC and PB H. SYNC signals through one input port (pin 56) by time-division method as well as done in the BR-S822.
② The CPU changes delay time of DRUM PG to yield DRUM FF and calculates data so as to obtain 6.5 H as a period from DRUM FF to PB V. sync. (The CPU changes delay time from the large amount of DRUM FF's delay .)
③ The CPU repeats data measurement six times to obtain a mean value of four measurement results excluding the largest and smallest ones, and writes it in the EEPROM.

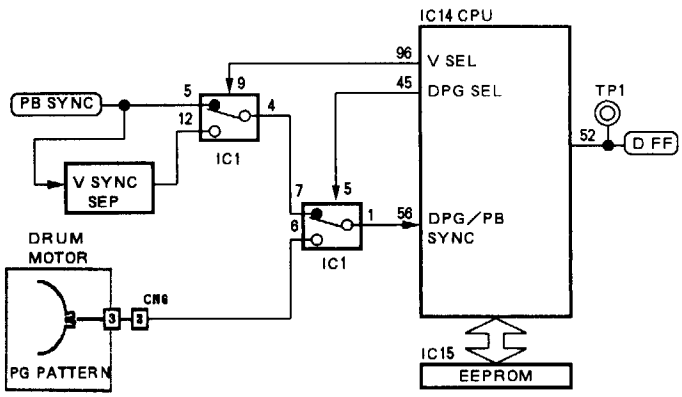


Fig. 7-5-5 PB switching point automatic adjustment circuit (SERVO/M-CTL board)

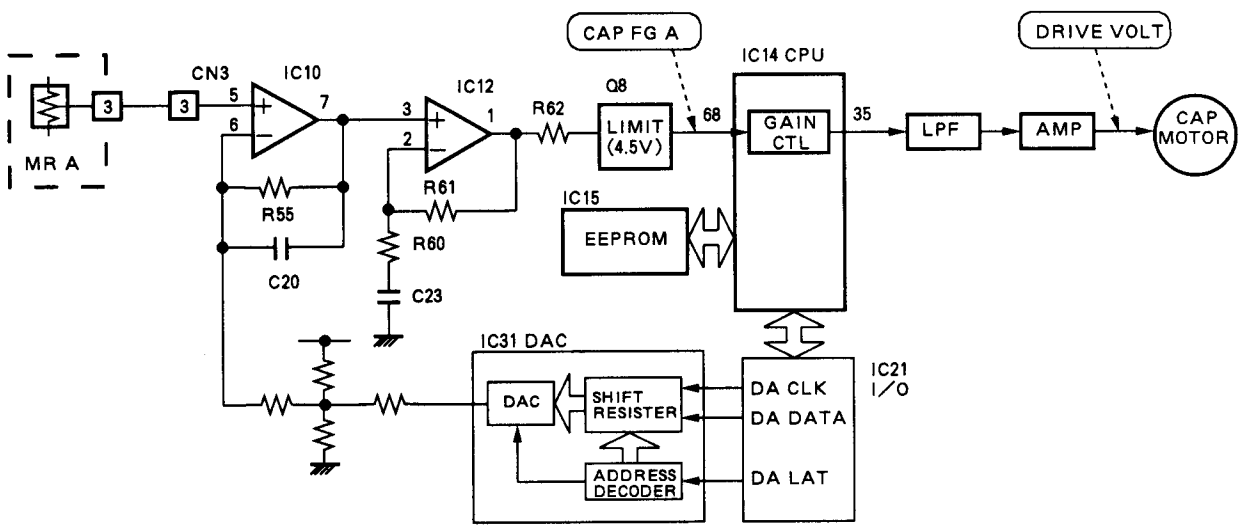


Fig. 7-5-4 Stop servo automatic adjustment circuit (SERVO/M-CTL board)

7.5.3 Automatic adjustment functions for audio system

(1) Table of audio system adjustment modes

There are two kinds of adjustment modes (automatic adjustment and manual adjustment) provided for the audio system, and either of adjustment modes is usable.

	Adjustment mode No.	Adjustment item
Manual adjustment	11	EE level adjustment
	12	PB level adjustment
	13	PB frequency response adjustment
	14	REC level adjustment
	15	REC frequency response adjustment
	16	Initialization of adjustment value
Automatic adjustment	17	Overall automatic adjustment (for factory use)
	18	Normal audio PB level adjustment
	19	Normal audio PB frequency response adjustment
	1A	Hi-Fi audio PB level adjustment
	1B	Normal audio REC level adjustment
	1C	Normal audio REC frequency response adjustment
	1D	Hi-Fi audio deviation adjustment
	1E	REC mode automatic adjustment

Table 7-5-1 Table of audio system adjustment modes

(2) Operation procedure

① Turn off the power switch.
② Turn on the power switch again and press the COUNTER RESET, FF and REW buttons simultaneously within 2 sec after the counter display is on.
③ Press the MENU (UP) or SET (DOWN) button continually until the desired adjustment No. appears in the counter display.

[Manual adjustment]
Manual adjustment procedure is the same as for previous models, namely, input required signal through the LINE IN terminal and connect a measuring instrument to the LINE OUT terminal.
④ Select a channel desired for adjustment with the AUDIO MONIOR switch.
CH1: for adjustment of CH1 only
CH2: for adjustment of CH2 only
MIX: for adjustment of both channels (BR-S800 only)
⑤ Select normal audio or Hi-Fi audio with the AUDIO MONITOR switch.
⑥ Switching between S-VHS and VHS modes depends on the type of cassette tape inserted.
⑦ Manual adjustment is effectuated by pressing the COUNTER RESET button.
⑧ Use the REC LEVEL VRs (TRACKING VR for BR-S500) for adjustment.
⑨ Adjustment value is written in the EEPROM by pressing the AUTO MODE switch.

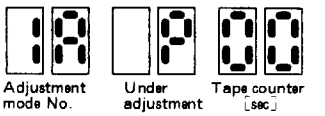
[Automatic adjustment]
Automatic adjustment needs neither connection of measuring instrument nor change of menu switch setting. (Actually, NR and Limiter circuits are off, and menu switch setting is accordingly unchanged.)

Note 1: Set the TRACKING VR to the center position.
Note 2: Proceed in the order of the adjustment mode numbers except No. 17.
Note 3: Do not use the adjustment mode No. 17 since this is provided for factory use only.

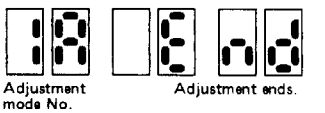
④ Pressing the COUNTER RESET button effectuate automatic adjustment mode.
⑤ When adjustment is completed, "End" appears in the counter display and the cassette tape is ejected.

In automatic adjustment the following indications appear in the counter display.

During adjustment

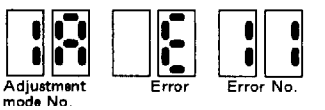


When adjustment ends



If adjustment error occurs, the following indications appear in the counter display.

When adjustment error occurs



Error No.	Detail of error
E11	Error in normal audio CH1 PB level adjustment
E12	Error in normal audio CH2 PB level adjustment
E13	Error in Hi-Fi audio L-ch PB level adjustment
E14	Error in Hi-Fi audio R-ch PB level adjustment
E15	Error in normal audio CH1 REC level adjustment
E16	Error in normal audio CH2 REC level adjustment
E17	Error in Hi-Fi audio L-ch deviation adjustment
E18	Error in Hi-Fi audio R-ch deviation adjustment
E19	Error in normal audio CH1 PB frequency response adjustment
E1A	Error in normal audio CH2 PB frequency response adjustment
E1B	Error in normal audio CH1 REC frequency response adjustment
E1C	Error in normal audio CH2 REC frequency response adjustment
E1D	Misinsertion of cassette tape

Table 7-5-2 Table of error numbers

(3) Initialization of adjustment value

The adjustment mode No. 16 is provided to preset the theoretical design values in the EEPROM.
If the EEPROM IC10 on the FM AUDIO board is replaced, the set is enabled to record and play back without performing respective adjustments. For actual use, however, make sure to adjust respective items to obtain better sound since the preset values are theoretical to the last.

① Take the cassette tape out of the set and then turn off the power switch.
② Turn on the power switch again, and press the COUNTER RESET, FF and REW buttons simultaneously within 2 sec after the counter display is on.
③ Press the MENU (UP) or SET (DOWN) button continually until the adjustment No. 16 appears in the counter display.
④ After pressing the COUNTER RESET button, press the AUTO MODE button to write the preset values in the EEPROM.

(4) Automatic adjustment mode

In the automatic adjustment modes (No. 17 through No. 1E) respective adjustments shown in Table 7-5-3 are performed automatically under control of the CPU of IC9 on the FM AUDIO board.

For carrying out the automatic adjustments, this model employs VCAs (Voltage Controlled Amplifier) as adjustment VRs, therefore, signal level is varied as the CPU controls output voltage of the D-A converter.
On the other hand, DC voltage generated by rectifying LINE OUT signal is supplied to the A-D input port (pin 58) of the CPU to enable it to measure output signal level.

(a) PB level adjustment

With playback of the 1 kHz reference signal of the alignment tape, the VCA for PB level adjustment is controlled so that the LINE OUT signal meets the specifications in the level.

(b) EE level adjustment

The CPU supplies the 1 kHz signal having the reference level from the PWM output terminal (pin 78) to the audio circuit. The automatic adjustment controls the VCA for EE level adjustment so that the LINE OUT signal meets the specifications in the level.
The VCA for normal audio EE level adjustment generally serves as the REC level adjustment VR on the front panel.

Adjustment item		Adjustment mode No.								Signal	REF. SIG.	SIG. CTL1	SIG. CTL2	GAIN CTL	GAIN CTL2	Level control terminal
		No. 17	No. 18	No. 19	No. 1A	No. 1B	No. 1C	No. 1D	No. 1E		IC9 -40	IC9 -39	IC9 -38	IC9 -16	IC9 -17	
Pilot signal search		◎								—	H	L	H	L	L	—
Normal audio CH1 PB level (1kHz)		◎	◎							Playback of MBA alignment tape	H	L	H	L	H	IC7pin8 (N. AUD PWB)
Normal audio CH2 PB level (1kHz)		◎	◎							Playback of MBA alignment tape	H	H	L	L	H	IC8pin8 (N. AUD PWB)
Normal audio CH1 PB frquency response (400Hz ⇒ 10kHz)		◎		◎						Playback of MH-6 alignment tape	H	L	H	H	L	IC7pin10 (N. AUD PWB)
Normal audio CH2 PB frquency response (400Hz ⇒ 10kHz)		◎		◎						Playback of MH-6 alignment tape	H	H	L	H	L	IC8pin10 (N. AUD PWB)
Hi-Fi audio L-ch PB level (1kHz)		◎			◎					Playback of MH-F6/MBAF-3 alignment tape	H	L	L	L	L	IC5pin8 (FM AUD PWB)
Hi-Fi audio R-ch PB level (1kHz)		◎			◎					Playback of MH-F6/MBAF-3 alignment tape	H	H	H	L	L	IC5pin10 (FM AUD PWB)
Normal audio CH1 EE level		◎				◎	◎		◎	PWM 24 kHz carrier, 1 kHz modulated wave	H	L	H	L	L	IC9pin8 (N. AUD PWB)
Normal audio CH2 EE level		◎				◎	◎		◎	PWM 24 kHz carrier, 1 kHz modulated wave	H	H	L	L	L	IC10pin8 (N. AUD PWB)
Normal audio REC level	REC mode	◎				◎			◎	PWM 24 kHz carrier, 1 kHz modulated wave	H	L	H	L	L	IC9/IC10pin10 (N. AUD PWB)
	CH1 adj. (PB mode)	◎				◎			◎	Play back selfrecorded signal.	H	L	H	L	L	—
	CH2 adj. (PB mode))	◎				◎			◎	Play back selfrecorded signal.	H	H	L	L	L	—
Normal audio REC frequency response	REC mode	◎					◎		◎	8 kHz pulse	H	L	H	H	L	Q201/Q202-B (N. AUD PWB)
	CH1 adj. (PB mode)	◎					◎		◎	Play back selfrecorded signal.	H	L	H	H	L	—
	CH2 adj. (PB mode))	◎					◎		◎	Play back selfrecorded signal.	H	H	L	H	L	—
Hi-Fi audio deviation	REC mode	◎						◎	◎	PWM 24 kHz carrier, 1 kHz modulated wave	H	L	L	L	L	IC2pin2/pin62 (FM AUD PWB)
	CH1 adj. (PB mode)	◎						◎	◎	Play back selfrecorded signal.	H	L	L	L	L	—
	CH2 adj. (PB mode))	◎						◎	◎	Play back selfrecorded signal.	H	H	H	L	L	—
Hi-Fi audio L-ch EE level		◎						◎	◎	PWM 24 kHz carrier, 1 kHz modulated wave	H	L	L	L	L	IC5pin8 (FM AUD PWB)
Hi-Fi audio R-ch EE level		◎						◎	◎	PWM 24 kHz carrier, 1 kHz modulated wave	H	H	H	L	L	IC5pin10 (FM AUD PWB)

Table 7-5-3 Function table of automatic adjustment modes

As shown in Fig. 7-5-6, the CPU outputs modulated-wave signal that 1 kHz signal is modulated in pulse width with 24 kHz carrier. This makes easy to remove higher harmonic component which is included in rectangular wave. This signal is converted into sine wave by an external LPF and then supplied to the audio circuit.

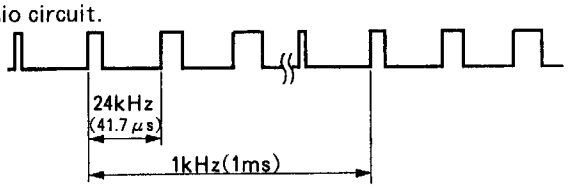


Fig. 7-5-6 Modulated-wave 1 kHz signal

(c) REC level adjustment

This set has no need of repeated operations of recording and playback for REC level adjustment as done for previous models, but requires recording and playback just once.

① The set enters in the REC mode.
② The CPU output 1 kHz signal of reference level from the PWM output terminal.
③ Controlling the VCA for REC level adjustment, the CPU raises signal level to be recorded on the tape by 0.5 dB every 2 seconds in 15 steps (±3.5 dB to the theoretical value). At that time, the CPU utilizes the value indicated by the tape counter for changing the REC level.

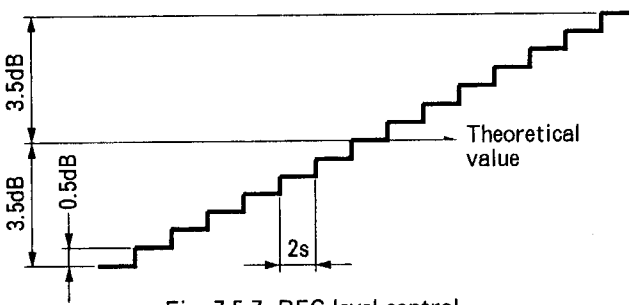


Fig. 7-5-7 REC level control

④ The CPU finalizes the REC level according to the value of the tape counter as the playback signal level meets the specifications.

(d) Normal audio PB frequency response adjustment

As the alignment tape (MH-8) on which 400 Hz and 8 kHz signals are recorded at the level of -20 dB is played back, the CPU adjusts the level of the 8 kHz signal so that it becomes 0 dB to that of the 400 Hz signal.

① The CPU searches the 400 Hz signal segment in the Search mode. (For detecting the frequency of a PB signal, the CPU inputs the PB signal through pin 2 (EV2).)
② The PB level of the 400 Hz signal is stored in the memory.
③ The 8 kHz signal segment is searched in the Search mode.
④ The CPU adjusts the VCA of the adding equalizer so that the PB level of the 8 kHz signal becomes 0 dB to the PB level of the 400 Hz signal.

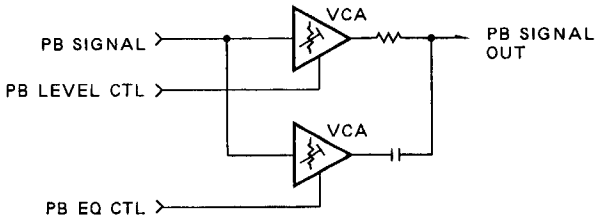


Fig. 7-5-8 Adding equalizer circuit

(e) Normal audio REC frequency response adjustment

The 8 kHz, -20 dB signal is recorded and played back to adjust its PB level so as to meet the specifications (-20 dB to the reference level).

① The CPU enters the set in the REC mode.
② The CPU outputs the 8 kHz, 0 dB signal from the PWM output terminal.
③ The CPU changes the signal level to -20 dB with the external 20 dB attenuator.
④ Controlling the VCA for bias level adjustment, the CPU decreases the REC bias level by 0.5 dB every 2 seconds in 13 steps (±3.0 dB to the theoretical value).
At that time, the CPU utilizes the value indicated by the tape counter for changing the bias level.
⑤ The CPU finalizes the bias level according to the value of the tape counter as the playback signal level meets the specifications.

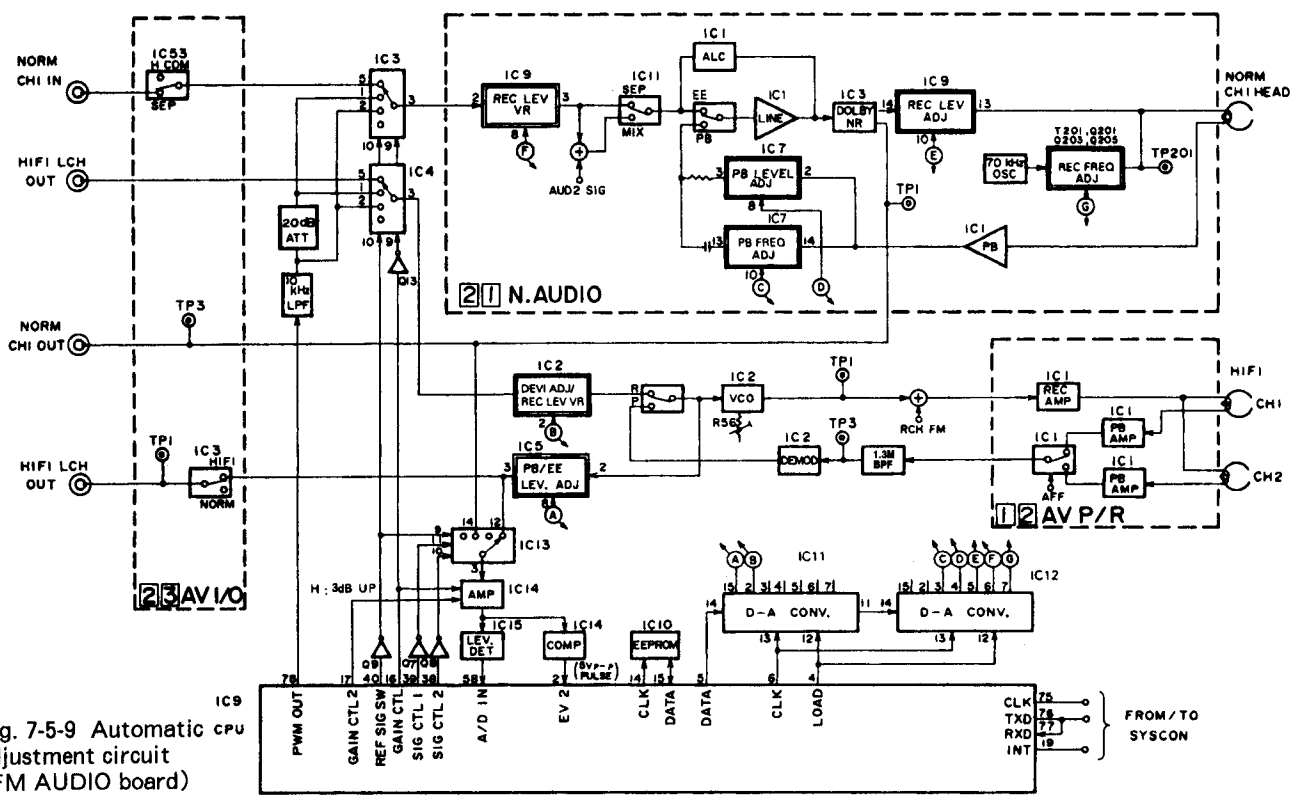
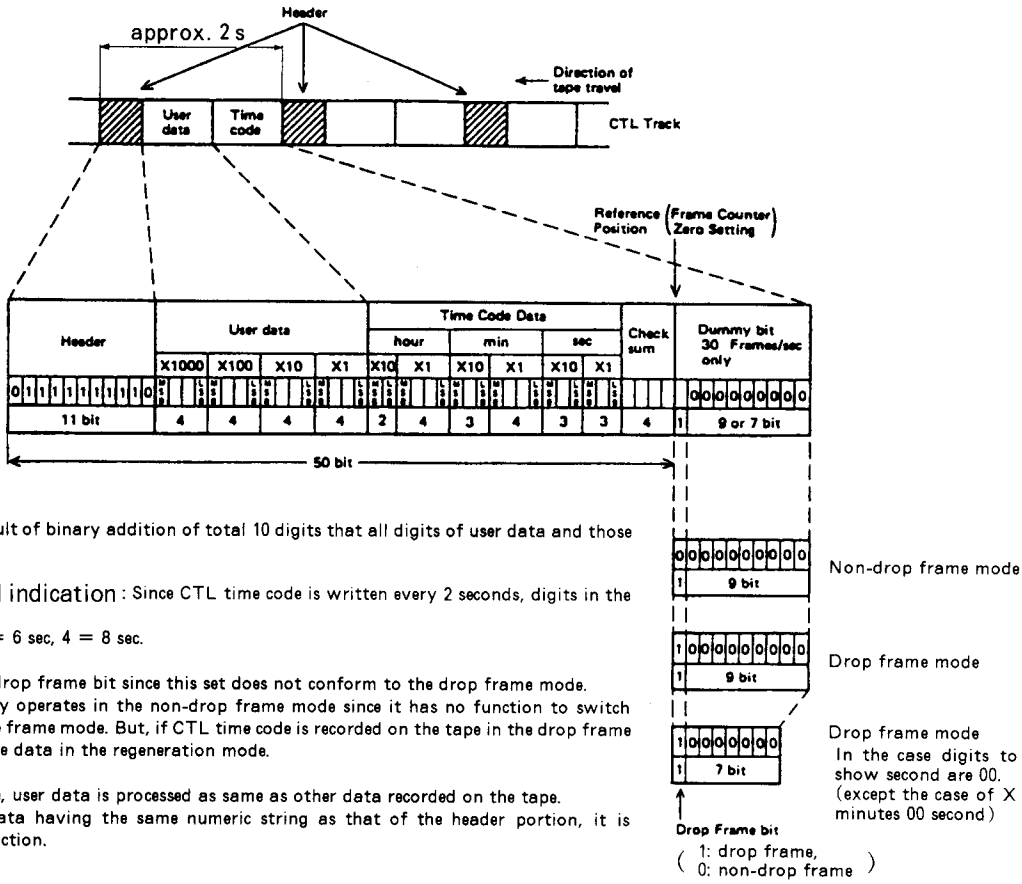


Fig. 7-5-9 Automatic CPU adjustment circuit (FM AUDIO board)

No.	Adjustment mode	Adjustment part	Specifications	Operation mode	Remark
00 [00]	–	–	–	–	
01 [01]	–	–	–	–	
02 [02]	–	–	–	–	
03 [03]	Slow tracking preset	[TRACKING VR]	No noise	+1/30X speed	[IN/+SHIFT]: to start adjustment [AUTO MODE]: to memorize adj. data
04 [04]	FG duty ratio/Stop servo	Automatic	–	Without cassette inserted	[IN/+SHIFT]: to start adjustment
05 [05]	–	–	–	–	
06 [06]	–	–	–	–	
07 [07]	Reversing torque	[IN/+SHIFT]:UP [OUT/−SHIFT]:DOWN	176g-cm	−1×	
08 [08]	–	–	–	–	
09 [09]	–	–	–	–	
0A [0A]	Take-up torque	[IN/+SHIFT]:UP [OUT/−SHIFT]:DOWN	170g-cm	REC or PLAY	
0B [0b]	Loading torque	[IN/+SHIFT]:UP [OUT/−SHIFT]:DOWN	30g-cm	PLAY	Supply reel motor is controlled by loading torque.
0C [0C]	Play back tension	[IN/+SHIFT]:UP [OUT/−SHIFT]:DOWN	BR-S800:58g-cm BR-S500:63g-cm	REC or PLAY	
0D [0d]	–	–	–	–	
0E [0E]	–	–	–	–	
0F [0F]	Switching point	Automatic	–	PB of MHP alignment tape	
10 [10]	–	–	–	–	
11 [11]	Audio EE level	BR-S800:[REC LEV VR]	−6dBs	EE	[COUNTER RESET]:to start adj. [AUTO MODE]:to memorize adj. data.
12 [12]	Audio PB level	BR-S800:[REC LEV VR] BR-S500:[TRC VR]	Normal : −6dBs HiFi : −6dBs	PB of MBA/MH-F6 alignment tape	Adjustment order: Normal audio: [12], [13], [11], [14],[15] Hi-Fi audio: [12], [14], [11] after carrier frequency adj.
13 [13]	Normal audio PB frequency response	BR-S800:[REC LEV VR] BR-S500:[TRC VR]	8 kHz : Same level as ref.(400Hz) level.	PB of MH-6 alignment tape	
14 [14]	Audio REC level	BR-S800:[REC LEV VR]	−6dBs	REC/PLAY	REC system should be adjusted both in the VHS and S-VHS modes.
15 [15]	Normal audio REC frequency response	BR-S800:[REC LEV VR]	8 kHz : Same level as ref.(400Hz) level.	REC/PLAY	
16 [16]	Audio EEPROM preset mode	–	–	–	
17 [17]	Overall automatic adjustment of audio system	Automatic	–	–	For factory use
18 [18]	Normal audio PB level	Automatic	–	PB of MBA alignment tape	
19 [19]	Normal audio PB frequency response	Automatic	–	PB of MH-6 alignment tape	
1A [1A]	Hi-Fi audio PB level	Automatic	–	PB of MH-F6 alignment tape	
1B [1b]	Normal audio REC level	Automatic	–	–	Should be adjusted both in the VHS and S-VHS modes.
1C [1C]	Normal audio REC frequency response	Automatic	–	–	Should be adjusted both in the VHS and S-VHS modes.
1D [1d]	Hi-Fi audio EE level	Automatic	–	–	
1E [1E]	Audio REC system automatic adjustment	Automatic	–	–	Should be adjusted both in the VHS and S-VHS modes.
1F [1F]	Loading/Unloading test mode	[IN/+SHIFT] : Loading [OUT/−SHIFT] : Unloading		Without cassette inserted	

Table 7-5-4 Table of adjustment modes

7.6 CTL TIME CODE


approx. 2 s
Header
Direction of tape travel
User data
Time code
CTL Track
Reference Position (Frame Counter Zero Setting)
Header
User data
Time Code Data
hour
min
sec
Check sum
Dummy bit 30 Frames/sec only
X1000 X100 X10 X1 X10 X1 X10 X1 X10 X1
11 bit 4 4 4 4 2 4 3 4 3 3 4 1 9 or 7 bit
50 bit
9 bit
Non-drop frame mode
9 bit
Drop frame mode
7 bit
Drop frame mode
In the case digits to show second are 00. (except the case of X minutes 00 second)
Drop Frame bit
(1: drop frame, 0: non-drop frame)

Check sum : Lower four bits of a result of binary addition of total 10 digits that all digits of user data and those of time code data.

Digit in the 1st place of second indication : Since CTL time code is written every 2 seconds, digits in the 1st place should be read as follows :

0 = 0 sec, 1 = 2 sec, 2 = 4 sec, 3 = 6 sec, 4 = 8 sec.

Drop frame bit : "0" is written as drop frame bit since this set does not conform to the drop frame mode.
Note : In this set the generator generally operates in the non-drop frame mode since it has no function to switch between drop frame mode and non-drop frame mode. But, if CTL time code is recorded on the tape in the drop frame mode, it is reproduced as the drop frame data in the regeneration mode.

User data : In the regeneration mode, user data is processed as same as other data recorded on the tape.
Note : If a user data contains any data having the same numeric string as that of the header portion, it is erroneously read out and causes malfunction.

Fig. 7-6-1 Construction of CTL time code

7.7 HEADS ARRANGEMENT ON UPPER DRUM

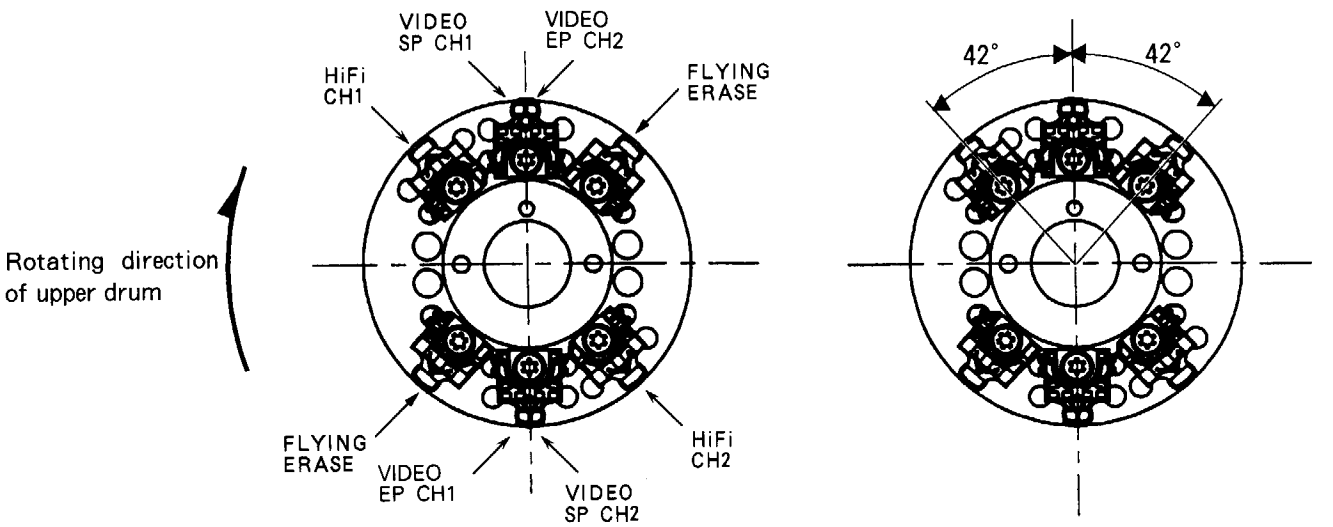


Fig. 7-7-1 BR-S800U heads arrengenment

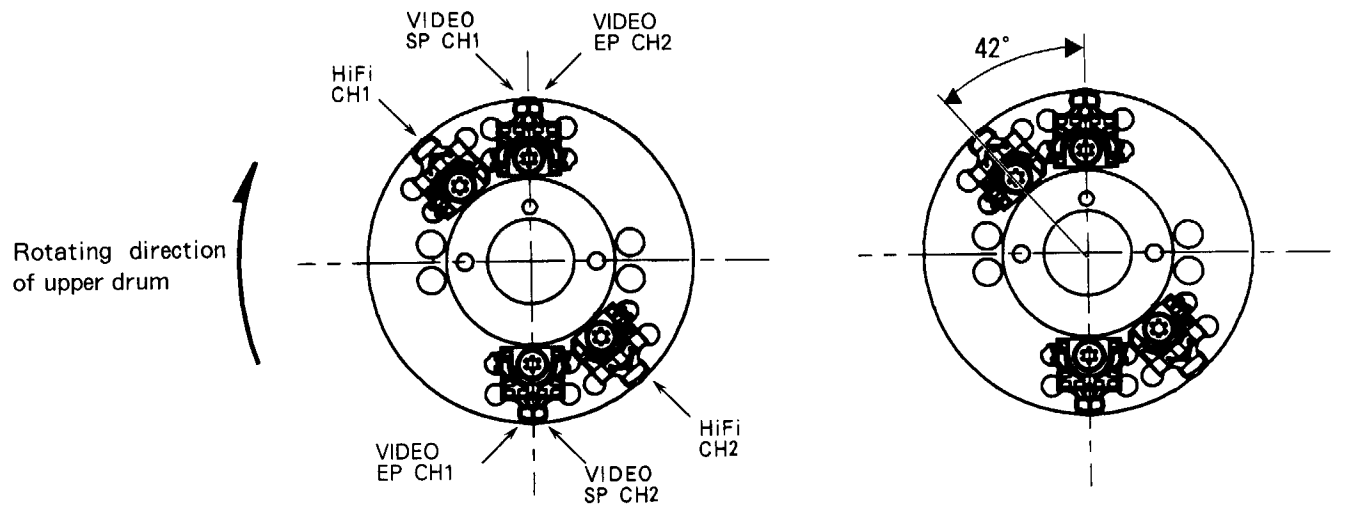


Fig. 7-7-2 BR-S500U heads arrengenment

7.8 COMPLEMENTED CIRCUITS

7.8.1 Modification of M-CTL/SERVO circuit for unification of noise bars in LINEAR SLOW/STILL mode

Since the BR-S800U/S500U has no special PB head differently from the 22-series VTRs, it compares outputs of the SP and EP heads in level and uses an output of the higher level as playback video signal. During playback in this system, there are two noise bars appearing in a picture occasionally in the LINEAR SLOW mode, because the SP head and EP head are different in width and output of the SP head that is the wider is mostly used for reproducing pictures. (Refer to the figure below.)

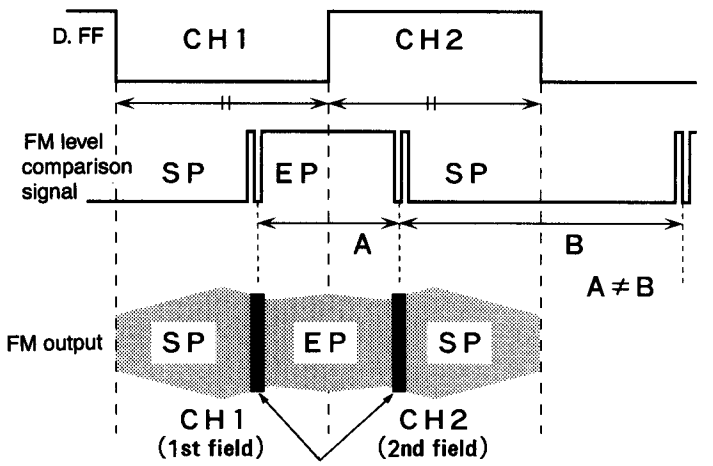


Fig. 7-8-1

Compared with the BR-S800U/S500U, the BR-S800U(A)/S500U(A) additionally employs a filter circuit in the M-CTL/SERVO circuit to equalize the duty ratio (50 %) of the head selection signal for the two heads. As a result, noise bars that appear in two in the BR-S800U/S500U are unified and only one noise bar appears in the LINEAR SLOW (slower than ±0.06 time speed) and STILL modes.

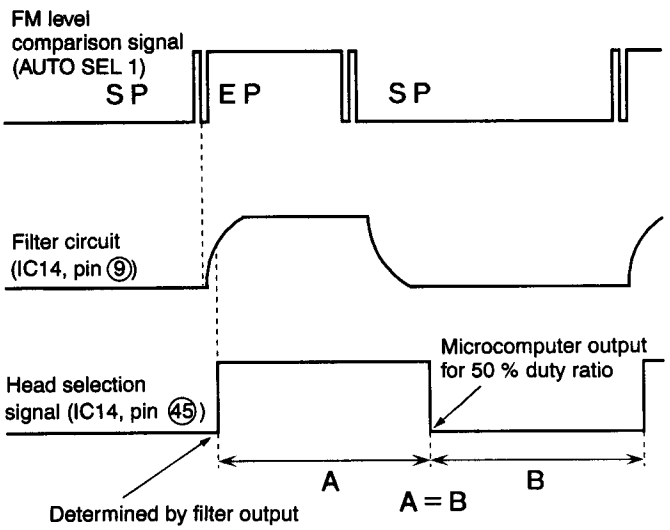


Fig. 7-8-2

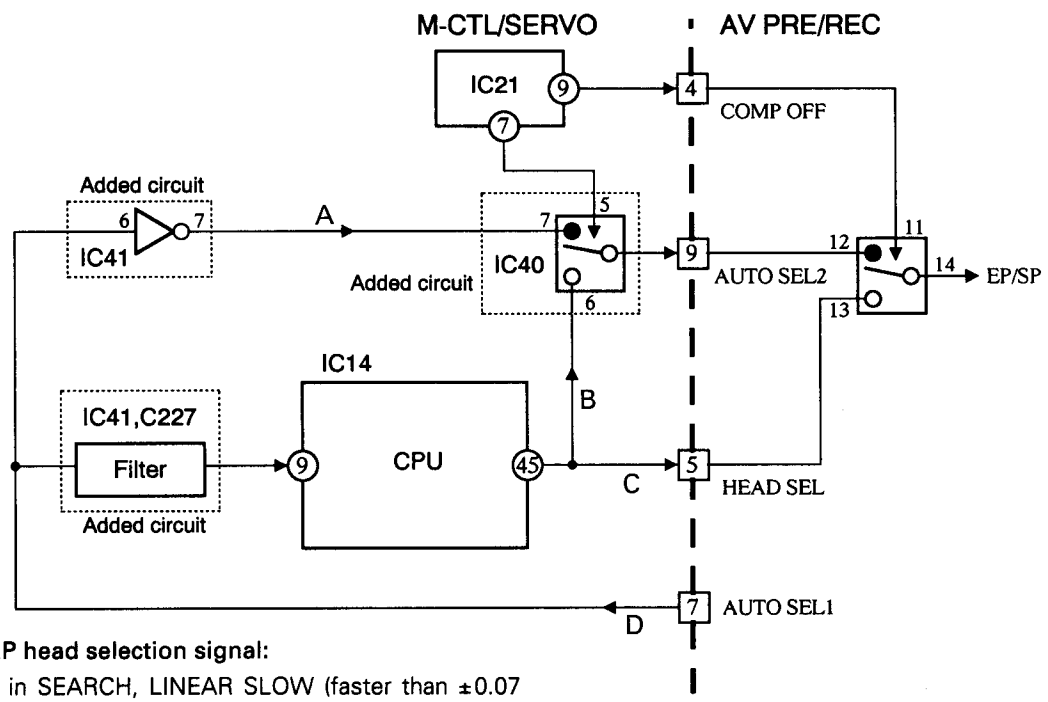


Fig. 7-8-3

Note on SP/EP head selection signal:

- A : Used in SEARCH, LINEAR SLOW (faster than ±0.07 time speed) mode
- B : Used in LINEAR SLOW (slower than ±0.06 time speed) mode
- C : Used in STEP SLOW mode
- D : FM level comparison signal

7.8.2 Modification of VIDEO-2 board for reducing sagging in LINEAR SLOW/STILL mode

Since the BR-S800U/S500U has no special PB head differently from the 22-series VTRs, it continuously plays the same track in slow-speed playback such as the SLOW PB and STILL modes. In such a case, the SP CH-1 and EP CH-1 heads are used for playing the CH-1 track, or the SP CH-2 and EP CH-2 heads are used for playing the CH-2 track.
In the respective head constructions that are shown by Fig. 7-7-1 and 7-7-2, the two heads are not located at an angle of 180°. Therefore, there occurs vertical dancing (sagging) for 2 H in a picture played back in the LINEAR SLOW/STILL mode.
As compared with the BR-S800U/S500U, the BR-S800U(A)/S500U(A) has an additional circuit (shown below) to the VIDEO-2 board. As a result of this modification, output of the EP head that precedes the SP head is delayed for 2 H and sagging is consequently reduced.

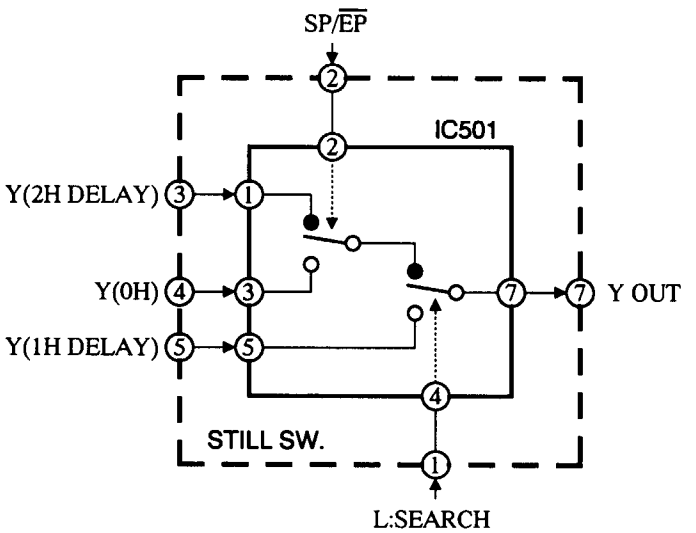


Fig. 7-8-4

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